Results of Chemical Analyses of Oregon Moist Pellet Fish Food, Component Meals and Marine Lipid Sources Used by DFO Salmonid Enhancement Program Facilities From February 1982 to March 1986.

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RESULTS OF CHEMICAL ANALYSES OF OREGON MOIST PELLET FISH FOOD, COMPONENT MEALS AND MARINE LIPID SOURCES USED BY DFO SALMONID ENHANCEMENT PROGRAM FACILITIES FROM FEBRUARY 1982 TO MARCH 1986.

by

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ABSTRACT

Plotnikoff, M. Dianne, C. L. Cross and J. R. Markert. 1987. Results of chemical analyses of Oregon Moist Pellet fish food, component meals and marine lipid sources used by DFO Salmonid Enhancement Program facilities from February 1982 to March 1986. Can. Data Rep. Fish. Aquat. Sci. 647: 29 p.

The results of chemical analyses of Oregon Moist Pellet fish food and its component ingredients by the Salmonid Enhancement Quality Control Program from February 1982 to March 1986 are reported.

Key words: chemical analysis, fish food, quality control

RÉSUMÉ

Plotnikoff, M. Dianne, C. L. Cross and J. R. Markert. 1987. Results of chemical analyses of Oregon Moist Pellet fish food, component meals and marine lipid sources used by DFO Salmonid Enhancement Program facilities from February 1982 to March 1986. Can. Data Rep. Fish. Aquat. Sci. 647: 29 p.

On présente les résultats d'analyses chimiques de boulettes humides de type Oregon, utilisées pour nourrir les poissons, ainsi que de leurs composantes. Ces analyses ont été effectuées de février 1982 à mars 1986 dans le cadre du Programme de contrôle de la qualité du Programme de mise en valeur des salmonidés.

Mots-clés: analyse chimique, aliments pour poisson, contrôle de la qualité

INTRODUCTION

The Salmonid Enhancement Program (SEP), Facility Operations Branch, in cooperation with the Fish Nutrition Group, Fisheries Research Branch, implemented a quality control program for fish feed in 1982 after a major outbreak of bilateral lens cataracts occurred in some hatchery chinook and coho stocks in 1981. Unusually high calcium-zinc ratios in one or more batches of Oregon Moist Pellets (OMP) were suspected to be the cause of the problem and recent findings by Richardson et al (1985, 1986) support this proposition.

The purposes of the quality control program were: (1) to ensure that the fish feed delivered to Canadian federal hatchery facilities met Canadian formulation and ingredient specifications (Tables 1-4) and (2) to identify by chemical means batches of fish meal, marine oils or finished diets which did not conform to the known acceptable standards for nutritional value and reject those before being used for salmonid culture. This was done by sampling at the manufacture site all finished feeds and component meals and oils destined for use in Canada and analyzing specific chemical parameters in these samples. The results were reported to the project co-ordinator within a specified time depending on the parameters tested. If the results of the analyses were within acceptable limits, then the food was cleared for use.

The focus of the fish food quality control testing program was the OMP formulation, the major fish feed used for salmonid culture at SEP facilities. This fish feed is an open formula diet and was developed by researchers from the Oregon State University and Oregon Fish Commission in the 1950's and 1960's (Tables 1-4). It was made under contract for SEP facilities by Moore-Clark Co. Inc., in La Conner, Washington, U.S.A.

This report summarizes the results of testing OMP as well as the component meals and oils in the feed from February 1982 to March 1986.

MATERIALS AND METHODS

PROCEDURES FOR ORDERING FEED

All SEP hatcheries were instructed to direct their feed orders to the head office at least 3-4 weeks before required delivery according to a defined order schedule so that:

1. accumulated orders could be combined into one production lot where possible

2. specialty lots of feed, particularly those ordered with supplemental vitamin C, could be combined into one lot

3. all feed destined for SEP facilities could be sampled and accurate records kept of feed quantities, pellet sizes and destinations

4. any changes in quantities and/or delivery dates could be co-ordinated between head office and the manufacturer

SAMPLING REGIME

From February 1982 until March 1983, Fisheries and Oceans staff travelled to the manufacture site at La Conner, Washington whenever it was possible to sample ingredients and feeds as they were being manufactured for SEP facilities. In April 1983, a sampling regime was implemented at the production site in co-operation with the manufacturer whereby a designated plant staff member sampled each lot of feed destined for a SEP facility. These samples were stored frozen until enough had accumulated for pick-up. Fisheries and Oceans' personnel would then pick up the accumulated samples every 2-3 weeks. This sampling regime allowed for every feed lot destined for SEP to be sampled rather than only those feeds manufactured when Fisheries personnel were present. Sampling continued in this way from 1983 to 1986.

Representative samples of 500 g of the component fish meals and feed were taken for each lot of feed destined for a SEP facility and packaged in plastic whirl-pac bags or gallon size "Zip-loc" storage bags at the time of manufacture. In addition, 250 ml duplicate samples of oil were taken from the oil tank at

the plant when it was full, half full and near empty. If the feed that was to be delivered to a SEP facility was taken from a lot already in the manufacturer's storage, then it was sampled by the the plant personnel as it was loaded onto the delivery truck. In this case, a composite sample was taken from 5% of the load or 10 bags, whichever was less and stored for pick-up in the usual manner. Each meal and oil sample was labelled with a unique sample number identifying an individual batch that could be followed through production runs for various pellet sizes. Each feed sample included a label with the following information: meal batch number, oil sample number, time sampled, diet type, pellet size, date sampled, production date, delivery date, destination and any type of supplementation.

All samples were kept frozen at -28°C at the manufacture site until enough had accumulated for pick-up. Samples were picked up as soon after the manufacture date as was possible. From February 1982 to March 1983, samples were transported to the laboratory in an insulated cooler packed with frozen freezer pacs. After that time, samples were transported in a cooler but stored on dry ice. A reference set of each feed, meal and oil sample was stored at -28°C at the West Vancouver Laboratory for at least 6 months for further evaluation if required.

LABORATORY SELECTION, REPORTING OF RESULTS AND DATA STORAGE

At the beginning of each fiscal year, the project coordinator and the scientific authority would decide on the parameters to measure, the frequency of analyses, and the acceptable tolerance limits for each parameter. The laboratory selected to perform the analyses was then determined by a competitive bidding procedure. The bid was awarded based on price/sample, demonstrated technical ability, available personnel to work on and co-ordinate the project, and the ability to supply the results within the requested time frame.

Can Test Ltd., 1523 West 3rd Street, Vancouver, B.C., Quanta Trace Laboratories Inc., 401-3700 Gilmore Way, Burnaby, B.C. or staff at the Department of Fisheries & Oceans, West Vancouver Laboratory performed the analyses listed during the times specified in the table below.

	February 82-March 83	April 83-March 84	April 84-March 85	April 85-March 86
Can Test	all analyses	vitamins A, E and B_2	vitamins A, E and B_2	all analyses
Quanta		mineral analyses	mineral analyses	
West Van Lab		proximate composition, fat quality tests, vitamin C	proximate composition, fat quality tests, vitamin C	

The results of key parameters were reported by telephone to the scientific authority for the quality control project within 4 working days of sample delivery and the results from all analyses were submitted in written form within 10 working days. Thus any anomolous results could be verified upon re-testing and immediate action taken if any feed did not meet specifications. Data from all analyses were stored on floppy discs for use on an Apple computer to establish a data base and for further analysis as required.

ANALYTICAL PROCEDURES

Analyses were performed in accordance with methods specified in the contract. The methods were those outlined in the "Official Methods of Analysis of the Association of Official Analytical Chemists" (AOAC) (12th edition) 1975 and the "Official and Tentative Methods of the American Oil Chemists' Society" (AOCS) 1976 unless otherwise noted. Lipid extraction was performed by the Bligh-Dyer method. Minerals were analyzed using Plasma Emission Spectroscopy using an Inductively Coupled Argon Plasma (ICAP) excitation source. Increased sensitivity analysis by cold vapor generation atomic absorption (AA) and/or hydride vapor generation AA was used for mercury, selenium and arsenic. Bacteriological tests were performed in accordance with procedures outlined in the "Bacteriological Analytical Manual for Foods" (BAMF) 1978 edition published by AOAC. Vitamins A and E were analyzed using a high-pressure liquid chromatographic (HPLC) technique.

PARAMETER MEASURED	METHOD
Proximate Composition - % crude lipid - % crude protein - % ash (*) - % moisture - % fiber	standard AOAC (N x 6.25)
Calorific Value	bomb calorimetry
% available lysine	Carpenter's method
Peroxide value, free fatty acids, Iodine number (*)	standard AOCS
Minerals except Hg,Se,As	plasma emission spectroscopy (ICAP)
- Hg, Se, As	atomic absorption spectroscopy
Vitamin C, riboflavin (*)	standard AOAC
Vitamins A, E (*)	HPLC
Bacterial Analyses - Total Plate Count (TPC)(*) - Escherichia coli (*) - Salmonella (*) - yeast and molds	BAMF

(*) key parameter; 4 working day verbal report required

RESULTS

The results (on a dry weight basis) of analyses on OMP, the component herring and anchovy meals, and marine lipid sources from February 1982 to March 1986 are shown in Tables 5-18. The results of analyses for some minerals, notably lead, cadmium, arsenic, mercury and iodine were often below the detection limit of the analytical instrument. In these cases, no conversions to a dry weight basis were made. Duplicate analyses were conducted for mineral and proximate composition, peroxide and calorific value, and iodine number on all samples submitted for analysis between July 1983 and March 1984. From April 1984 to March 1985, the only results reported as duplicates were the mineral compositions in the feed and meal samples. The average of the duplicate results was entered onto the data tables. All other results were reported as a single value.

Feed samples were sorted according to the OMP formula type (OP II, OP IV or OM 3) within a contract year and the results of herring and anchovy meal analyses were kept separate.

The parameters tested in each contract year varied as did the number of tests done on each sample. This is reflected in differences in the column headings in the tables from year to year.

Some SEP facilities requested 50% supplemental Vitamin C be added to their feed. This is shown as either a yes or no under a column heading entitled extra Vitamin C. All other ingredients were added according to the respective specifications for each year.

It was necessary to abbreviate some words in the column headings in the tables because of lack of space. The abbreviations and the full names are listed on the next page.

ABBREVIATION	FULL NAME
DDMMYY	date as day, month, year
NO.	number
ANAL	analysis
PROD/PRODUCT	production
MOIST	moisture
PROT	protein
CALOR	calorific
PEROX	peroxide
VIT	vitamin
DELIV	delivered
NA	not available
MPN	most probable number
VAL	value
DESTIN'TN	destination-refers to specific SEP hatchery
-VE	negative
TPC	total plate count

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Table 1: Formula and ingredient specifications for Oregon Moist Pellet mash. (OM-3)

INGREDIENT	PERCENTAGE OF DIET		COMMENTS
	1982	1983-86	
Herring meal	48.0	49.9	
Wheat germ meal	10.0	10.0	
Dried whey product or dried whey	10.0	8.0	
Vitamin premix	1.5	1.5	See Table 4
Mineral premix		0.1	See Table 4
Wet mix	20.0	20.0	
Herring, menhaden or refined tuna oil	10.0	10.0	
Choline chloride	0.5	0.5	Liquid, 70% product
	100	100	

Restrictions: Restrictions for the various components varied from year to year. A range of values is provided where applicable.

Herring meal - minimum 70% protein, maximum 3-4% salt, minimum 8-14% fat and maximum 15-17% ash.

Wheat germ meal - minimum 23% protein and 7% fat.

Dried whey product or dried whey - minimum 12% protein, maximum 6% moisture, maximum 10-19% ash, maximum 3% salt.

Wet mix - two or more of the following pasteurized wet fish products with none exceeding 10% of the diet; (1) salmon or tuna viscera (no heads or gills), (2) herring, and (3) whole bottomfish. Enzymes may be used to aid liquification.

Oil - stabilized with 0.04% BHA-BHT (1:1), free fatty acids not more than 3%. The BHA-BHT must be added at time of reprocessing if reprocessed oil is used.

Table 2: Formula and ingredient specifications for Oregon Moist Pellet (OP IV) formula (for 1/16 inch and smaller pellets). The final product shall carry the following guaranteed analysis: crude protein, not less than 35%, crude fat, not less than 10%, crude fiber not more than 4% and moisture, not more than 35%.

INGREDIENT	PERCENTAGE OF DIET	COMMENTS
	May 83 - March 86	
Whole herring meal	47.5	
Sodium bentonite	3.0	
Wheat germ meal	6.4	
Dried whey product, or dried whey	4.0	
Vitamin premix	1.5	See Table 4
Mineral premix	0.1	See Table 4
Wet mix	30.0	
Herring, salmon, dogfish (not more than 3%), menhaden or refined tuna oil.	7.0	
Choline chloride	0.5	Liquid, 70% product
	100	

Restrictions: Varied for each component from year to year. A range of values is provided where applicable.

Herring meal - minimum 70% protein, maximum 3-5% salt, 8-12% fat and 15-17% ash.

Wheat germ meal - minimum 23% protein and 7% fat.

Dried whey or dried whey product - minimum 12% protein, maximum 6% moisture, 10-19% ash and 3% salt.

Wet mix - 2 or more of the following pasteurized wet fish products, with no product exceeding 15% of the diet. (1) salmon or tuna viscera (no heads or gills) (2) whole herring (3) whole bottomfish (4) whole salmon and (5) whole hake. Special condition when using hake; add 0.5 % oil for every 10 % hake in total diet. Approved enzymes may be used to aid liquification.

Oil - stabilized with 0.04% BHA-BHT (1:1) or liquid anti-oxidant. Less than 3% free fatty acids. The anti-oxidant must be added at the time of reprocessing if reprocessed oil is used.

Table 3: Formula and ingredient specifications for Oregon Moist Pellet (OP II formula). All pellet sizes to March 1983, and for 3/32 and larger pellets from May 1983 onwards. The final product shall carry the following guaranteed analysis: crude protein, not less than 35%, crude fat, not less than 10%, crude fiber, not more than 4% and moisture, not more than 35%.

INGREDIENT	PERCENTAGE OF DIET	COMMENTS
Meal mix	28.0	level to supply not less than than 21.5% fish meal protein
Cottonseed meal	15.0	prepressed, solvent extracted
Dried whey product or dried whey	5.0	
Wheat germ meal	remainder	
Corn distillers dried solubles	4.0	may contain up to 30% grains in place of solubles
Mineral premix	0.1	see Table 4
Vitamin premix	1.5	see Table 4
Wet mix	30.0	
Fish oil	6.0-6.75	
Choline chloride	0.5	liquid, 70% product
	100	

Restrictions:

Ingredient restrictions varied slightly throughout the years. A range of values is provided where applicable.

Meal mix - All fish meals with maximum 3-5% salt, 8-12% fat, and maximum 17% ash. Herring meal (minimum 67.5% protein) must be used at no less than 50% of fish meal in each batch. Anchovy (minimum 65% protein), capelin (minimum 67% protein), and hake (minimum 68% protein) may be used as remainder. 1982-83 - for 1/16" and smaller pellets, herring meal with minimum 70% protein, maximum 3% salt.

Cottonseed meal - minimum 48% protein, maximum 0.055% free gossypol.

Wheat germ meal - minimum 23% protein and 7% oil.

Dried whey - minimum 12% protein, maximum 6% moisture, 3% salt, and 10-19% ash.

Wet mix - 2 or more of the following pasteurized products, with none exceeding 15% of the diet.
(1) salmon or tuna viscera (no heads or gills) (2) whole herring (3) bottomfish (whole or fillet scrap), (4) dogfish and (5) whole hake. Approved enzymes may be used to aid liquification.
Special condition when using hake - add 0.5% oil for every 10% hake in diet.

Herring, salmon, dogfish (not more than 3%), menhaden or refined tuna oil - Stabilized with 0.04% BHA-BHT (1:1). Less than 3% free fatty acids. The BHA-BHT must be added at the time of reprocessing if reprocessed oil is used.

Table 4: Oregon Moist Pellet vitamin and trace mineral premix specifications.

VITAMIN PREMIX	MINIMUM ANALYSIS (mg/lb premix)			SOURCE LIMITATION
	FEB/82-MAY/84	JUNE/84-JUNE/85	JULY/85-MAR/86	
VITAMIN C	27,000	27,000	27,000	ASCORBIC ACID
d-BIOTIN	18.0	18.0	18.0	
VITAMIN B12	1.8	1.8	1.8	
VITAMIN E	15,200 I.U.	15,200 I.U.	15,200 I.U.	WATER DISPERSIBLE, ALPHA TOCOPHERYL ACETATE.
FOLACIN	385	385	500	FOLIC ACID
MYO-INOSITOL	8,000	4,000	4,000	NOT PHYTATE
VITAMIN K	180	180	180	MENADIONE SODIUM BISULPHITE COMPLEX
NIACIN	5,700	5,700	6,700	
d-PANTOTHENIC ACID	3,200	3,200	3,200	d-CALCIUM PANTOTHENATE or d L-CALCIUM PANTOTHENATE
VITAMIN B6	535	535	935	PYRIDOXINE HCL
RIBOFLAVIN	1,600	1,600	1,600	
THIAMINE	715	715	1,287	THIAMINE MONONITRATE
VITAMIN A			50,000 I.U.	

MINERAL PREMIX	GUARANTEED ANALYSIS OF ELEMENT (g/lb mix)		
	FEB/82-JUNE/84	JULY/84-MAR/86	
ZINC SULPHATE	34.0	34.0	($ZnSO_4$-84g/lb MINERAL MIX)
MANGANOUS SULPHATE	34.0	34.0	($MnSO_4$-94g/lb MINERAL MIX)
FERROUS SULPHATE	4.5		($FeSO_4 \cdot 7H_2O$-22.5 g/lb MIX)
COPPER SULPHATE	0.7	0.7	($CuSO_4$-1.77 g/lb MINERAL MIX)
POTASSIUM IODATE	0.23	0.23	(KIO_3-0.38 g/lb MINERAL MIX)
COBALT SULPHATE	2.3		($CoSO_4 \cdot H_2O$-6.7 g/lb MIX)

1. -DILUENT MUST BE A CEREAL PRODUCT.

-CERTIFIED VITAMIN PREMIX TO BE SUPPLIED BY RECOGNIZED MANUFACTURER OTHER THAN FEED CONTRACTOR AND MUST SHOW DATE OF PREPARATION.

-THE VITAMIN PREMIX IS NOT TO BE HELD IN STORAGE LONGER THAN TWO MONTHS AFTER THE DATE OF PREPARATION.

Table 5: Chemical analyses of marine lipid samples used in the manufacture of OMP for SEP facilities from March 1982 to March 1986.

SAMPLE NUMBER	SAMPLE DATE (DDMMYY)	DATE DELIVERED FOR ANALYSIS (DDMMYY)	SAMPLE TIME	PEROXIDE VALUE (meq/ kg OIL)	IODINE NUMBER (mg I/ g OIL)	% FREE FATTY ACIDS (AS OLEIC)
04-080382	080382	090382	1100	15.6	163.0	4.4
05-180382	180382	180382	1000	8.7	139.0	4.5
06-010482	010482	020482	1030	4.2	143.0	4.2
07-200482	200482	210482	1300	4.8	141.0	2.7
09-040582	040582	050582	1330	10.8	103.0	3.5
10-210582	210582	210582	900	4.1	76.6	6.7
11-150982	150982	150982	1100	6.6	125.0	2.3
12-290982	290982	290982	900	3.9	114.0	3.4
13-271082	271082	291082	1140	3.4	173.0	1.3
15-061282	061282	071282	330	5.1	172.0	2.7
17-050183	050183	050183	1030	6.4	158.0	2.0
18-260183	260183	260183	1130	5.1	140.0	3.5
19-080283	080283	080283	1040	7.5	153.0	.9
22-140383	140383	140383	1130	7.7	127.0	.6
23-060483	060483	060483	1100	3.7	108.0	2.2
24-170583	170583	170583	1100	2.6	111.7	2.1
25-060783	060783	060783	1000	5.8	103.2	2.0
26-020883	260783	030883	830	5.1	102.7	2.0
28-240883	110883	240883	*	2.3	113.3	1.9
29-141083	000983	141083	*	1.0	107.0	3.2
30-141083	101083	141083	*	2.7	109.3	2.1
31-141083	121083	141083	*	2.1	106.1	2.0
34-201283	051283	201283	*	2.4	113.5	2.1
35-201283	*	201283	*	1.9	125.0	2.1
36-090184	*	090184	*	1.5	114.0	2.9
37-270184	*	270184	*	3.8	145.0	1.8
38-090284	*	090284	*	5.7	154.5	1.5
39-090284	*	090284	*	3.9	156.0	1.5
40-280284	*	280284	*	6.3	NA	1.6
41-280284	*	280284	*	5.3	NA	1.6
42-270384	*	270384	*	6.0	159.0	2.5
43-270384	*	270384	*	9.7	112.0	2.5
A-5-I	*	260484	*	2.6		3.0
A-5-III	*	260484	*	2.5		1.5
B-2-I	*	260484	*	3.9		1.5
B-3-I	*	170584	*	2.1		3.4
B-3-III	*	170584	*	2.1		3.3
A-6-I	*	140684	*	1.6		1.8
C-4-II	*	140684	*	2.0		2.5
B-4-III	*	180784	*	1.9		4.6
C-4-III	*	180784	*	2.5		3.8
C-5-I	*	070884	*	2.5		3.7

Table 5 con't: Chemical analyses of marine lipid samples used in the manufacture of OMP for SEP facilities from March 1982 to March 1986.

SAMPLE NUMBER	SAMPLE DATE (DDMMYY)	DATE DELIVERED FOR ANALYSIS (DDMMYY)	SAMPLE TIME	PEROXIDE VALUE (meq/ kg OIL)	IODINE NUMBER (mg I/ g OIL)	% FREE FATTY ACIDS (AS OLEIC)
WV DRY OIL	*	070884	*	1.7		2.7
C-5-II	*	060984	*	2.6		5.1
C-5-III	*	060984	*	3.2		4.8
B-5-I	*	101084	*	2.9		4.5
B-5-III	*	101084	*	3.1		4.7
C-6-I	*	051184	*	2.0		3.0
A-7-I	*	301184	*	2.9		3.9
B-6-III	*	301184	*	2.8		4.5
A-8-III	*	210185	*	4.6		2.4
B-7-III	*	210185	*	4.5		3.0
B-7-I	*	171284	*	4.1		2.5
A-9-II	*	040285	*	3.3	149.0	4.1
B-9-I	*	040285	*	2.8	146.0	4.0
?	*	040285	*	3.6	131.0	7.0
O-1	*	150485	*	2.1	124.4	3.3
O-2	*	060585	*	3.5	156.4	3.1
O-3	*	300585	*	3.2	133.1	3.3
O-4	*	030685	*	3.5	126.3	3.2
O-5	*	220785	*	3.2	120.3	2.3
O-6	*	220785	*	3.0	129.7	2.4
O-7	*	030985	*	.6	107.9	2.9
O-8	*	300985	*	3.2	108.7	3.7
O-9	*	281085	*	1.8	138.9	2.4
O-10	*	281085	*	2.9	140.5	2.1
O-11	*	251185	*	1.9	144.5	1.3
O-12	*	251185	*	2.1	144.3	1.2
O-14	*	100186	*	2.9	137.4	1.9
O-15	*	040286	*	16.1	136.0	2.6
O-16	*	040286	*	11.0	135.8	3.9
O-17	*	250286	*	NA	132.0	NA
O-18	*	250286	*	NA	132.0	NA
O-19	*	180386	*	2.4	120.0	2.1
O-20	*	180386	*	5.3	117.0	3.1
				----	----	----
			AVERAGE	4.1	130.4	2.9
			MAXIMUM	16.1	173.0	7.0
			MINIMUM	.6	76.6	.6
			NUMBER	73	52	73

* BECAUSE OF CHANGES IN THE SAMPLING PROCEDURE, SAMPLE DATES AND TIMES WERE NO LONGER RECORDED.

Table 6: Chemical analyses of the anchovy meal used in the manufacture of Oregon Moist Pellet fish food. (on a dry weight basis)

SAMPLE NUMBER	MEAL TYPE	SAMPLE DATE (DDMMYY)	SAMPLE TIME	ANALYSIS DATE (DDMMYY)	% MOISTURE	% PROTEIN	% ASH	% LIPID	% LYSINE	IODINE (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	K (ppm)	P (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)	TPC #/g	E.coli MPN/g	Salmonella
34-201283	ANCHOVY	051283		201283	6.2	71.4	19.4		5.1	<5	76.5	.11	<.1	67537	4.5	242	<3	1860	8.8	.11	5133		2.2	5720	77.6			
39-090284	ANCHOVY	270284		270284	9.0	74.2	18.5		6.8	<5	88.0	.4	3	47500	6.1	264	<3	2305	13.0	<.07	13500		4.9	11000	97.9			
40-280284	ANCHOVY	270284		270284	9.0	74.5	17.7		6.2	<5	120.0	.45	2.85	49100	6.5	245	<4	2485	15.0	<.07	13600		5.2	10600	104.0			
06-260484	ANCHOVY	050484	845	260484	7.0	74.0	18.1		6.2		195	.55	2.65	47850	6.7	258	<5	2280	17.0	.09	12000	30750	7.9	9130	99.4			
80-060984	ANCHOVY	220884	235	060984	5.8	72.7	19.1		6.5		10	.55	2.4	46150	8.9	376	<3	2475	11.0	<.06	11050	27300	4.6	11350	84.7			
109-261184	ANCHOVY	261184		261184	9.6	73.5	18.0		5.07		220	10.4	1.85	52350	7.0	346	<4	3275	14.0	.175	14600	31550	1.45	15700	85.0			
121-171284	ANCHOVY	061284	830	171284	8.6	71.3	15.2		5.55		320	2.4	2.25	45950	9.9	468	<4	2475	14.0	<.07	13150	25600	4.3	11100	121.5			
148-040285	ANCHOVY	290185	700AM	040285	10.3	70.8	16.7		5.2		365	3.8	1.9	39300	5.9	378	<3	2425	14.0	<.06	11000	24150	4	10350	92.8			
157-260285	ANCHOVY	130285	300	260285	8.4	71.5	16.8		4.8		415	.5	1.8	42450	5.7	430	<3	2655	15.0	<.07	12400	24650	4.45	11950	93.2			
187-190385	ANCHOVY	160385	1100	190385	7.1	69.3	17.8		4.8		255	3.7	2	40500	6.6	365	<4	2575	14.0	<.07	12050	22500	3.75	14600	102.0			
TN6	ANCHOVY	020485	1200	150485	9.1	72.2	16.3	11.2			152	5	1.5	38394	5.5	341	<.8	2279	11.8	.04	10341	NA	5.1	12651	96.8	10000	<.3	-VE
TN18	ANCHOVY	090985	800	300985	9.7	73.0	16.4	11.1			233	<30	<2.5	39867	37.8	402	<8	2591	17.5	.04	10244	26135	5.04	12625	135.0	2000	<.3	-VE
TN20	ANCHOVY	301085	830	251185	8.0	74.6	18.0	10.9			36.8	<30	<2.5	37174	9.6	499	<8	2446	15.4	.09	9598	25217	3.8	15761	101.0	2000	<.3	-VE
TN26	ANCHOVY	200186	NA	040286	3.2	70.6	15.4	13.0			252	<30	.76	36570	4	548	<8	2035	13.1	.16	14669	25000	1.9	8957	105.4	12000	<.3	-VE
TN27	ANCHOVY	110286	700 AM	250286	8.1	72.0	16.2	11.5			131	<30	1.57	39718	<1.5	521	<8	2448	17.6	.03	14146	30686	3.6	14799	105.0	22000	-VE	-VE
				AVERAGE	7.9	72.4	17.3	11.5	5.6		191.3	2.5	2.0	44694	8.9	379		2441	14.1	.09	11832	26685	4.1	11753	100.1	9600		
				MAXIMUM	10.3	74.6	19.4	13	6.8		415	10.4	3	67537	37.8	548		3275	17.6	.17	14669	31550	7.9	15761	135	22000		
				MINIMUM	3.2	69.3	15.2	10.9	4.8		10	.11	.76	36570	4	242		1860	8.8	.03	5133	22500	1.45	5720	77.6	2000		
				NUMBER	15	15	15	5	10		15	11	12	15	14	15		15	15	8	15	11	15	15	15	5		

Table 7: Chemical analyses of the herring meal used in the manufacture of Oregon Moist Pellet fish food. (on a dry weight basis)

SAMPLE NUMBER	MEAL TYPE	SAMPLE DATE (DDMMYY	SAMPLE TIME	ANALYSIS DATE (DDMMYY)	MOISTURE %	PROTEIN %	ASH %	LIPID %	LYSINE %	IODINE (ppb)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Hg (ppm)	Mn (ppm)	Mg (ppm)	K (ppm)	P (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)	TPC E.coli Salmonella
																										MPN/g
95-100282	HERRING	100282		100282	3.0	69.3	18.5		4.8	18.9	47.9	<0	<.6	53406	2.0	415	<2	3227	12.9	.06	NA	1.03	11341	96.9			
06-010482	HERRING	020482		020482	3.2	73.7	15.8		4.3	3.5	12.1	<0	<.6	53716	4.1	242	<2	3099	12.4	.14	3326	1.24	9948	117.8			
13-271082	HERRING	271082		271082	5.1	76.2	13.4		5.5	NA	NA	NA	<.6	38787	4.2	128	<2	1310	10.4	.07	2551	1.69	5101	84.2			
18-260183	HERRING	260183		260183	4.6	73.8	17.7		5.4	NA	303.9	<0	<.6	40767	5.3	629	<2	1677	15.2	.19	2819	1.68	21274	96.9			
26-020883	HERRING	260783		030883	5.8	74.6	14.7		3.25	<.5	130	.45	<.01	35450	3.7	171	<3	1560	10.0	<.05	4600	1.4	13850	84.7			
28A-240883	HERRING	230883		240883	6.4	75.6	15.1		5.94	<5	19	.8	<.1	40250	4.7	150	<3	1540	11.5	.10	4220	1.4	15300	77.0			
28B-240883	HERRING	110883		240883	6.0	74.9	15.4		5.96	<5	12	1.2	<.1	44400	4.5	204	<3	1590	12.5	.10	3560	1.5	12800	79.0			
35-201283	HERRING	071283		201283	5.7	74.9	17.2		6.37	<5	78	.25	<.1	38000	4.2	225	<3	1590	9.4	<.09	5260	1.6	25000	76.2			
39-200284	HERRING	270284		270284	6.8	74.4	16.8		6.08	<5	105	.4	.25	35000	4.3	258	<3	1615	11.0	<.08	5750	1.6	21000	80.5			
03-260484	HERRING	040484	1030	260484	4.2	76.0	14.4		6.15		155	2.95	<.2	33250	4.4	223	<5	1560	12.0	<.1	6600	24150	2.60	12400	80.1			
18-260484	HERRING	170484	730	260484	4.8	72.5	16.2		5.84		165	.2	.3	37350	4.8	242	<5	1570	11.5	<.1	6600	24650	3.6	21600	75.6			
27-170584	HERRING	170584	1200	170584	3.8	75.3	15.4		7.07		315	1.1	.35	60200	6.7	444	<5	1975	23.5	.15	3200	33750	1.95	7010	103.0			
33-170584	HERRING	050584	330	170584	4.1	77.4	15.1		7.30		200	1.4	.2	46000	5.1	250	<3	1595	13.0	.08	3100	25300	1.9	6205	88.2			
40-170584	HERRING	140584	100	170584	3.2	78.6	13.3		6.70		100	.8	.2	45300	5.9	460	<3	1725	12.0	.1	4350	24000	1.65	5410	81.5			
44-170584	HERRING	170584	900	170584	3.3	76.2	9.5		5.40		150	1.1	.3	36800	4.8	160	<3	1595	9.4	.07	7750	24100	2.4	10950	76.0			
49-140684	HERRING			140684	4.1	76.9	14.7		6.36		245	2.8	.2	46800	5.4	232	<3	1645	14.0	<.07	3450	26400	2	7240	103.0			
51-140684	HERRING			140684	1.4	77.1	13.5		6.48		190	.99	.2	46900	5.2	140	<3	1635	14.5	<.06	3400	26600	2	7455	112.0			
58-140684	HERRING			140684	2.1	76.3	14.8		6.54		245	1.7	<.1	52300	5.6	182	<3	1825	17.0	<.07	3600	28500	1.7	5200	122.5			
63-180784	HERRING	180784	800	180784	5.0	75.0	16.8		5.97		200	1.2	.35	57500	4.3	151	<4	1755	12.0	<.07	4050	31000	1.9	5125	88.3			
66-180784	HERRING	070784	700	180784	4.7	77.5	14.5		6.08		175	1	.2	48200	4.7	174	<4	1625	14.5	<.07	2950	26800	1.7	5235	94.3			
71-070884	HERRING	300784	805	070884	4.4	76.2	13.8		7.06		215	.95	.2	45150	5.9	174	<3	1825	9.8	<.06	3750	25200	1.6	6575	100.6			
76-060984	HERRING	080884	700	060984	5.3	77.0	15.2		7.12		145	1.6	.5	49500	4.9	130	<4	1820	12.5	<.07	3550	27100	1.35	5745	89.0			
79-060984	HERRING	220884	230	060984	4.5	75.3	17.9		6.99		10	1	.45	36100	3.3	188	<3	1620	11.0	<.06	6450	22500	2	19950	73.7			
88-101084	HERRING	110984	1100	101084	6.1	76.6	13.3				175	2.75	.2	36100	4.3	192	<4	1600	10.0	<.07	3500	23850	2.55	15000	78.0			
101-051184	HERRING	171084	830	051184	5.4	74.2	14.1		5.02		145	4.1	.3	36350	4.4	198	<3	1770	12.0	<.06	5300	22750	1.8	16650	75.2			
108-261184	HERRING	191184		261184	6.7	72.9	14.6		5.02		230	5.9	.25	44200	4.5	226	<3	2085	14.5	<.06	7500	27750	.93	20900	77.3			
115-171284	HERRING	031284	830	171284	6.2	72.2	14.1		4.55		140	.6	<.1	41000	10.6	198	<3	1850	13.0	<.07	7185	25500	1.7	19950	97.2			
120-171284	HERRING	051284	830	171284	5.3	73.4	14.1		5.76		145	.67	<.1	53000	8.4	626	<3	2305	17.0	<.06	5350	27750	1.55	7060	136.0			
141-210185	HERRING	140185		210185	5.8	70.0	13.4		6.05		120	.25	<.1	38750	4.4	199	<3	2575	13.0	<.06	6190	22650	1.6	6600	73.1			
149-040285	HERRING	040285	700AM	040285	6.5	72.0	14.1		6.19		140	.85	.1	44950	3.7	255	<3	1770	15.0	<.06	5550	25000	2	3560	111.0			
154-260285	HERRING	110285	700	260285	5.9	70.1	14.9		4.89		155	1.4	.3	50200	4.2	290	<3	2020	17.0	<.06	6000	26550	2.1	4300	102.0			
161-260285	HERRING	250285		260285	9.1	73.9	14.0		5.72		145	.67	<.2	44300	3.6	350	<4	2015	15.0	<.07	6050	24250	1.9	4350	89.7			
169-050385	HERRING	270285	230	050385	4.6	75.2	13.1		5.82		84	.25	.2	34400	6.0	196	<3	2590	9.6	<.07	5550	21800	1.0	8140	99.6			
180-190385	HERRING	110385	730AM	190385	7.9	76.1	10.9		5.32		125	.67	.2	30600	6.8	200	<3	1620	10.1	<.06	6995	19600	1.3	3940	91.4			
186-190385	HERRING	160385		190385	5.2	72.3	17.9		5.17		180	.25	.2	42700	8.2	602	5	2555	14.0	<.06	5835	23350	2.4	6540	111.0			
TR7	HERRING	020485	1200	150485	6.2	72.5	14.3	11.1			13.8	<3	<.25	41787	7.0	647	1.4	2537	13.9	.06	5695	NA	2.88	4157	100.7	70000	<.3	-VE
TR8	HERRING	150485	700AM	060585	4.2	73.2	16.2	10.8			9.5	<7.5	<.75	43639	5.2	141	<2	1295	10.4	.16	1503	25056	3.53	13468	78.3	20000	<.3	-VE
TR9	HERRING	180485	730	060585	4.0	71.0	14.5	12.5			12.1	<7.5	<.75	37512	4.5	234	<2	2636	8.3	.05	5502	23862	9.64	9899	87.5	80000	<.3	-VE
TR10	HERRING	080585	800	220585	2.2	71.3	14.4	11.5			17.9	<7.5	<.75	38836	4.3	130	<2	2555	9.2	.10	4016	22484	1.47	7961	85.8	12000	0	-VE
TR11	HERRING	130585	800	220585	1.7	69.7	14.8	13.1			14.0	<7.5	<.75	37120	4.5	147	<2	2390	8.9	.09	5329	22469	1.72	11695	88.0	12000	<.3	-VE
TR12	HERRING	200585	900	220585	2.0	70.8	13.6	13.0			11.7	<7.5	<.75	37536	4.6	211	<2	2683	9.1	.09	4733	22236	1.39	8578	87.6	15000	<.3	-VE
TR13	HERRING	030685	700AM	240685	2.4	71.7	14.4	11.8			12.6	<7.5	<.75	45920	3.2	111	<2	2080	11.1	.09	3956	25830	1.34	8897	86.4	<1000	<.3	-VE
TR14	HERRING	270685	700	220785	4.2	75.1	15.3	10.5			47.0	<30	<2.5	46450	5.2	230	<8	1420	10.4	.13	2944	26100	1.28	8352	88.7	7000	<.3	-VE
TR15	HERRING	150785	800AM	220785	3.2	74.0	15.2	10.8			<15	<30	<2.5	40290	5.2	192	<8	1157	10.3	.19	2582	22313	1.26	10181	82.6	6500	<.3	-VE
TR16	HERRING	130885		030985	3.1	72.5	17.3	9.7			20.6	<30	<2.5	53140	5.2	170	<8	1373	11.4	.17	2405	20586	7.53	12407	82.6	7000	<.3	-VE
TR17	HERRING	090985	800	300985	3.3	74.9	13.3	11.7			<15	<30	<2.5	38568	6.1	172	<8	1623	13.4	.20	2585	22955	2.25	9089	109.6	5000	<.3	-VE
TR19	HERRING	021085	1030	281085	4.9	75.9	13.0	11.9			31.0	<30	<2.5	36084	5.6	220	<8	1662	9.6	.27	7154	25353	1.85	8216	82.4	80000	<.3	-VE
TR21	HERRING	131185	700	251185	6.7	70.2	13.9	12.3			25.7	<30	<2.5	34411	5.5	230	<8	1619	11.8	.26	6550	25192	2.33	8619	88.2	70000	<.3	-VE
TR22	HERRING	301085	830	251185	7.2	79.3	13.4	12.2			25.8	<30	<2.5	34173	5.4	277	<8	1620	11.3	.25	6694	25010	2.29	8926	89.3	4360000	<.3	-VE
TR23	HERRING	041285	600	161285	3.2	75.5	13.9	11.8			100.8	<30	.33	40000	3.9	116	<8	1284	14.5	.20	3925	24275	1.31	11053	71.3	18000	<.3	-VE
TR24	HERRING	060186	600	100186	5.0	75.2	13.5	11.1			<15	<30	<.1	39382	4.2	130	<2.5	1369	12.0	.23	2885	24219	2.38	7940	91.0	3000	<.3	-VE
TR25	HERRING	200186	230	040286	5.7	77.6	13.8	9.3			<15	<30	<.1	40200	3.0	190	<8	1357	12.8	.37	4346	24486	1.80	10250	86.1	1100000	<.3	-VE
TR28	HERRING	110286	700AM	250286	5.1	73.4	15.9	11.1			27.2	<30	<.1	47000	<1.5	480	<8	1360	14.7	.25	2624	31304	1.50	13200	97.3	22000	-VE	-VE
TR29	HERRING	270286	900	100386	6.9	75.8	13.7	10.5			<15	<30	<.1	44786	2.2	362	<8	1761	15.9	.20	4275	31576	2.18	3340	99.3	8000	-VE	-VE
TR30	HERRING	030386	700	100386	5.7	74.3	14.3	12.3			38.2	<30	<.1	36994	2.3	331	<8	1664	11.2	.24	6074	30740	2.02	12402	84.3	63000	-VE	-VE
				AVERAGE	4.8	74.5	14.8	11.5	5.9	11.2	113.7	1.3	.26	42427	4.9	251	3.2	1855	12.4	.2	4681	25475	2.09	10480	90.9	313605		
				MAXIMUM	9.1	79.3	18.9	13.5	7.3	18.9	315.0	5.9	.50	60200	10.6	647	5.0	3227	23.5	.4	7750	33750	9.64	25000	136.0	4360000		
				MINIMUM	1.4	69.3	9.5	9.3	3.2	3.5	9.5	.2	.10	38600	2.0	111	1.4	1157	8.3	.1	1503	19600	.93	3340	71.3	3000		
				NUMBER	55	55	55	20	34	2	49	31	22	55	54	55	2	55	55	30	54	45	55	55	55	19		

Table 8: Results of chemical analyses of Oregon Moist Pellet fish food (OP II formula) from February 1982 to March 1983. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VITAMIN C	PROD DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% FIBER	% ASH	CALOR. VALUE (cal/g)	PEROX. VALUE (meq/kg OIL)	IODINE NO. (eq I/g OIL)	VIT C mg/100g	VIT E (ppm)	VIT A (ppm)	VIT B2 (ppm)	IODINE (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	K (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)
1A-190282	3/64	OP II	NO	250481	190282	27.3	20.4	55.2	2.9	11.2	6033	7.5	141.4	14.2	467.7	33.9	66.2	24.7	71.9	<8	<.6	26220	9.0	222	<2	3422	20.8	.06	6983	.87	4595	74
2A-190282	1/16	OP II	NO	161281	190282	28.5	18.1	53.3	3.1	10.2	5394	16.6	137.6	63.1	519.4	24.4	68.3	17.1	111.4	<8	<.6	21560	10.6	249	<2	3108	85.5	.08	6622	.98	3780	146
3A-020382	1/32	OP II	NO	120981	050382	28.3	17.1	49.5	1.0	10.8	5226	10.9	130	15.0	518.5	23.2	80.2	15.3	83.5	<8	<.6	24742	9.6	523	<2	3558	135.9	.07	6547	.88	5060	183
3B-020382	3/64	OP II	NO	031181	050382	27.7	18.6	52.6	3.2	10.2	4223	10	133	9.8	474.7	23.0	70.1	16.6	84.2	<8	<.6	22908	8.4	230	<2	3146	147.7	.12	7383	.73	5423	182
4A-080382	1/32	OP II	NO	080382	090382	28.9	15.7	53.7	3.1	12.0	3835	12.7	119	62.5	592.2	53.3	72.2	122.7	81.1	<8	<.6	29610	8.8	321	<2	3736	125.3	.12	5499	.96	6599	179
4B-080382	1/32	OP II	YES	080382	090382	28	15.3	53.9	2.8	12.0	4059	7.7	120	210.7	475.4	41.7	72.1	103.6	80.6	<8	<.6	28912	9.0	310	<2	3670	117.3	.08	5699	.99	6575	171
5A-180382	5/32	OP II	NO	180382	180382	28.7	13.4	54.5	3.1	12.2	5026	6.6	123	160.3			66.6	30.0	122.5	<8	<.6	26740	8.3	308	<2	3430	126.4	.10	4956	.84	6356	179
5B-180382	3/64	OP II	NO	180382	020482	27.7	13.8	52.0	3.0	12.8	4968	4.4	131	67.6	NA	NA	68.2	23.7	90.8	<8	<.6	30636	10.8	316	<2	3519	131.8	.09	9812	.94	5975	192
6A-010482	3/64	OP II	YES	010482	020482	28.9	14.5	52.7	2.5	11.8	4864	7.7	134	332.8	594.7	45.3	76.6	43.9	100.0	<8	<.6	25521	10.0	248	<2	3384	133.0	.08	10392	.82	7558	199
6B-010482	1/16	OP II	YES	010482	210482	29.8	16.0	54.1	2.6	12.8	5055	5.3	130	278.3	600.9	49.7	134.5	25.3	112.9	<8	<.6	29252	8.0	369	<2	3266	93.0	.10	6234	.72	6660	148
7A-190482	1/8	OP II	NO	190482	210482	29.4	15.9	55.9	2.7	11.8	5339	4.8	116	248.9	442.0	23.2	77.4	16.3	258.4	<8	<.6	23998	8.5	369	<2	2911	117.6	.13	8378	.92	7881	169
9A-040582	3/32	OP II	YES	270482	050582	25.8	14.0	54.8	2.8	11.7	5224	7	94	285.5	493.4	17.1	68.0	17.8	175.5	<8	<.6	23895	12.0	304	<2	2794	144.5	.15	8505	1.19	5265	181
9B-040582	1/16	OP II	YES	210482	050582	25.7	12.6	55.8	2.7	12.2	5130	5	92	342.1	394.2	16.5	79.1	14.9	134.7	<8	<.6	23490	11.3	310	<2	3078	158.0	.13	8626	1.13	7128	197
9C-040582	3/64	OP II	YES	220482	050582	28.2	13.1	53.0	2.4	12.5	5032	6.9	114	289.4	384.8	26.5	71.2	18.8	119.3	<8	<.6	28356	12.6	285	<2	3586	132.7	.06	5977	.88	6394	189
9B-040582	3/32	OP II	YES	040582	050582	30.2	15.7	53.6	2.7	13.0	5148	5.6	105	302.4	467.2	17.6	102.1	18.9	105.1	<8	<.6	29315	12.6	283	<2	3561	123.1	.06	6549	.99	6364	187
9E-040582	5/32	OP II	YES	300482	050582	29.2	15.4	56.4	2.5	11.6	5288	5.4	85	272.1	458.7	14.7	269.7	20.9	105.8	<8	<.6	21573	11.8	289	<2	2778	117.0	.17	8573	1.06	4935	157
10A-210582	1/16	OP II	YES	210582	210582	31.1	20.4	53.5	3.9	11.6	5597	3.9	74.2	91.2	395.4	59.7	102.2	8.7	128.3	<8	<.6	20880	9.7	267	<2	3103	134.8	.17	12064	1.22	10078	183
11A-150982	1/8	OP II	YES	140982	150982	30.8	17.5	56.3	3.6	10.9	5510	10	113	88.3	445.4	39.6	108.6	33.2	184.2	<8	<1.5	21315	10.6	287	<2	2987	121.8	.09	10005	1.29	4263	181
11B-150982	1/16	OP II	NO	100682	150982	29.5	15.3	52.5	3.4	11.2	5396	8.8	94	15.3	443.5	53.7	137.2	6.0	62.2	<8	<1.5	23004	9.2	219	<2	2939	50.1	.09	10508	1.08	4871	103
12A-290982	1/8	OP II	NO	290982	290982	27.5	17.5	53.8	2.9	10.2	5313	9.1	117	13.5	411.9	46.6	118.3	19.3	108.1	<8	<2.5	23460	11.5	288	<2	3105	125.2	.14	9867	.84	4237	174
13A-271082	3/32	OP II	YES	300982	291082	30	18.0	50.6	3.1	11.6	5377	9.9	114	24.9	367.6	53.1	118.1	17.0	118.1	<8	<.6	22880	11.4	309	<2	2846	108.4	.10	9652	1.22	5520	157
13B-271082	1/8	OP II	YES	300982	291082	28.4	17.5	54.2	2.7	10.5	5432	6.6	102	62.3	503.9	39.1	148.0	21.6	108.5	<8	<.6	19460	14.1	260	<2	2884	124.0	.06	10724	.88	4452	168
15A-061282	1/8	OP II	NO	061282	071282	30	15.7	54.8	3.6	10.3	5148	12.1	144	50.6	440.2	21.3	87.7	41.9	86.5	<8	<.6	19448	11.6	263	<2	3132	108.5	.11	11283	1.23	4447	160
18A-260183	1/32	OP II	YES	260183	260183	28.2	16.0	51.4	2.8	11.3	5143	8.5	129	23.8	439.7	47.3	119.4	75.3	83.4	<8	<.6	20711	10.8	243	<2	3155	135.5	.21	9994	1.20	12371	185
18B-260183	1/8	OP II	YES	200183	260183	29.7	18.2	52.0	3.0	10.9	5339	10.6	120	7.2	413.9	9.5	127.4	28.8	106.4	<8	<.6	22010	11.6	267	<2	3408	118.6	.14	11971	1.12	6859	165
18C-260183	3/32	OP II	YES	240183	260183	27.1	16.9	51.2	2.7	11.0	5179	10.1	127	13.4	220.2	14.7	156.9	30.8	99.7	<8	<.6	19865	11.6	232	<2	3028	133.6	.16	9152	1.23	11097	181
18B-260183	1/32	OP II	YES	250183	260183	29.4	15.3	NA	2.6	11.6	5325	10.2	130	15.2	382.8	41.9	113.3	48.6	94.9	<8	<.6	20732	12.1	237	<2	3181	117.9	.17	10082	1.15	14200	166
18E-260183	1/32	OP II	YES	260183	260183	25.2	14.1	49.0	2.1	11.7	4985	7.5	114	54.8	357.5	47.6	103.4	44.0	85.2	<8	<.6	18760	9.7	225	<2	2908	110.3	.16	8831	1.19	13052	161
19A-080283	5/32	OP II	YES	070283	080283	30.7	17.0	52.7	2.4	10.5	4982	8.8	133	16.7	288.0	34.7	94.0	41.9	63.1	<8	<.6	19872	11.7	235	<2	3312	119.5	.12	9014	1.25	6610	166
19B-080283	3/64	OP II	YES	030283	080283	29.8	22.2	52.8	2.3	11.1	5382	7.6	112	150.0	401.3	20.3	115.7	42.6	69.6	<8	<.6	22152	11.5	202	<2	3195	117.0	.18	8279	1.21	4771	168
19C-080283	3/64	OP II	YES	270183	080283	28.1	17.1	50.3	2.1	11.1	5143	7.6	87	28.4	380.6	43.1	177.6	25.3	73.0	<8	<.6	19460	12.3	217	<2	3114	130.8	.15	8076	1.15	10953	177
19B-080283	1/32	OP II	YES	080283	080283	29.6	20.7	53.4	2.7	9.7	5368	9.1	116	7.5	515.3	29.5	134.2	22.0	66.0	<8	<.6	21584	11.6	196	<2	3167	115.0	.18	7853	1.32	4118	163
22A-140383	1/16	OP II	NO	140383	140383	30.3	15.7	52.6	2.6	12.3	5205	6.9	101	169.5	518.5	33.9	214.6	56.3	214.5	<8	<.6	26598	11.9	595	<2	3146	111.5	.13	14300	1.00	5191	154
22B-140383	3/64	OP II	YES	140383	140383	29.5	16.5	53.1	2.3	11.8	5396	5	102	144.7	462.4	19.2	132.3	59.9	160.5	<8	<.6	24140	11.1	362	<2	3209	123.1	.11	8463	.99	6759	168
					AVERAGE	28.7	16.5	53.2	2.8	11.4	5149	8.1	115.7	115.7	452.2	33.3	110.3	33.9	110.3			23619	10.7	289		3199	118.1	.12	8731	1.04	6776	168
					MAXIMUM	31.1	22.2	56.4	3.9	13.0	6033	16.6	144	342.1	600.9	59.7	269.7	122.7	258.4			30636	14.1	595		3736	158.0	.21	14300	1.32	14200	199
					MINIMUM	25.2	12.6	49.0	1.0	9.7	3835	3.9	74.2	7.2	220.2	9.5	66.2	6.0	62.2			18760	8.0	196		2778	20.8	.06	4956	.72	3780	74
					NUMBER	34	34	33	34	34	34	34	34	34	32	32	34	34	34			34	34	34		34	34	34	34	34	34	34

Table 9: Results of chemical analyses of Oregon Moist Pellet fish food (OP IV formula) from April 1983 to March 1984. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VIT C	PRODUCT DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% FIBER	% ASH	CALOR. VAL. (cal/g) OIL)	PEROX. VAL. (meq/kg OIL)	IODINE NO. (mg I/ g oil)	VIT C (mg/ 100 g)	VIT E (ppm)	VIT A (ppm)	VIT B2 (ppm)	IODINE (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	K (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)
25B-060783	1/32	OP IV	NO	020683	060783	30.7	17.4	55.6	1.4	17.6	5141	3.3	111.7	19.2	391.5	15.3	NA	<3	1540	.92	<.2	38000	6.8	765	<5	2220	81	<.1	8525	2.4	9455	118
25F-060783	1/16	OP IV	YES	240583	060783	28.1	17.8	57.3	2.1	16.1	5325	3.5	117.5	15.7	434.0	8.8	NA	<3	1705	.43	.4	29250	8.4	818	<5	2640	120.5	<.1	9935	1.9	13850	147
25M-060783	3/64	OP IV	NO	140683	060783	29.8	17.8	57.5	1.1	15.9	5337	2.0	111.9	12.9	387.7	14.6	NA	<3	2000	.37	.4	30050	6.6	858	<5	2700	93.8	<.1	9805	2.0	13100	122.5
25I-060783	1/16	OP IV	NO	240583	060783	29.3	27.2	54.7	1.7	14.9	5432	3.3	82.4	22.6	469.2	16.2	NA	<3	1645	.23	.4	25850	6.5	789	<5	2420	121.5	<.1	7980	1.9	11150	136.5
25K-060783	1/16	OP IV	NO	200583	060783	29.5	20.4	56.1	1.4	14.9	5489	2.6	112.8	14.9	451.1	21.7	NA	<3	1705	.22	.4	29650	6.8	820	<5	2295	126.5	<.1	8640	2.0	12050	145.5
26C-020884	3/64	OP IV	NO	110783	030883	28.3	16.8	55.2	1.3	17.2	5189	4.1	122.9	12.5	554.3	72.1	66.3	<5	2485	.85	.1	21350	4.9	1020	<3	2040	111.5	<.07	6550	1.5	8895	161.5
26D-020883	1/16	OP IV	NO	110783	030883	27.7	20.4	55.2	1.2	15.7	5469	3.4	114.9	9.8	181.1	46.5	10.2	<5	2085	1	.2	29300	5.1	941	<3	1835	107.5	<.07	6250	1.4	9900	171
26E-020883	1/32	OP IV	NO	110783	030883	34.6	10.9	60.3	1.5	18.1	4942	22.5	129.4	15.0	512.5	68.1	107.1	<5	2375	1.1	.2	37600	5.2	1016	<3	2100	110.5	<.07	7600	1.6	8855	257
35A-201083	1/32	OP IV	NO	071283	201283	29.6	20.0	55.9	1.4	15.5	5765	2.8	125.5	21.2	452.7	49.3	83.9	<5	1365	.35	<.2	37150	6.8	642	<5	1760	111.5	<.09	6680	1.7	4535	127.5
35B-201083	3/64	OP IV	YES	071283	201283	27.3	19.5	56.2	1.7	15.6	5665	4.3	124.0	18.9	529.2	38.9	76.2	<5	1310	.35	<.15	36650	7.5	749	<4	1830	130.5	<.09	6210	1.7	4380	178
35C-201083	1/16	OP IV	NO	071283	201283	29.1	19.2	55.8	1.4	15.9	5495	3.0	115.5	7.2	516.1	29.5	97.4	<5	1085	.25	<.2	28600	9.3	570	<4	1765	98.2	.1	5165	1.1	15900	131.5
35B-211283	1/16	OP IV	YES	061283	201283	28.8	18.0	55.7	1.8	15.4	5130	1.6	127.5	128.9	481.0	39.2	99.3	<5	1375	.3	<.2	33200	7.0	742	<4	1985	105.5	<.1	6305	1.4	12250	146
35E-201283	1/32	OP II	YES	071283	201283	28.2	18.8	56.6	1.7	15.6	5395	3.1	128.0	189.7	600.1	58.7	108.4	<5	1515	.3	<.2	36800	6.3	673	<4	1915	112	.15	7240	1.0	5470	130
36C-090184	1/32	OP IV	YES	040184	090184	27.8	19.2	56.6	1.1	15.4	5422	10.9	122.5	11.4	262.0	49.8	108.6	<5	1325	.3	.3	32750	10.8	724	<4	1730	136.5	<.09	5970	1.6	5075	190.5
36B-090184	3/64	OP IV	YES	030184	090184	28.7	17.5	57.1	1.5	16.4	5386	10.4	123.5	76.3	225.5	51.2	124.0	<5	1220	.3	.2	34000	6.7	713	<5	2130	132.5	<.09	8250	1.5	7435	168.5
36J-270184	1/32	OP IV	NO	160184	270184	27.1	18.5	55.1	1.5	16.2	5455	4.4	130.0	1.6	463.1	49.3	81.0	<5	2175	.8	.3	37150	13.2	869	<4	2370	148	<.09	9130	2.5	11250	175
37A-270184	3/64	OP IV	NO	160184	270184	28.4	18.0	56.0	1.3	16.4	5385	3.9	122.5	1.7	482.2	47.2	95.2	<5	2390	.4	.2	34250	8.6	1021	<4	1915	97.9	<.09	5950	1.8	5245	133
37B-270184	3/64	OP IV	YES	180184	270184	27.4	17.0	58.0	1.5	16.4	5340	5.7	135.5	1.7	195.4	40.0	98.8	<5	2790	.9	.2	30350	10.4	1050	<4	2275	147.5	.1	6800	1.4	9005	156.5
37C-270184	1/16	OP IV	NO	230184	270184	28.0	18.5	55.7	1.5	15.6	5420	6.0	133.0	1.7	248.3	41.6	86.5	<5	2955	.9	.3	29450	6.5	1040	<4	2125	146.5	.1	7650	1.4	14500	132
37E-270184	1/32	OP IV	YES	250184	270184	29.1	17.5	56.4	1.4	12.4	5380	4.9	143.0	.8	408.6	50.5	81.2	<5	2515	.6	.8	33300	8.2	942	<5	2235	132	<.1	8350	2.1	10600	136.5
37K-090284	1/16	OP IV	NO	230184	090284	28.9	18.8	55.8	1.7	15.9	5780	3.0	132.5	3.1	414.4	85.3	70.4	<5	1595	.2	.2	27700	6.7	672	<4	1930	107.5	<.08	8555	1.0	18850	128.5
37L-090284	1/32	OP IV	NO	250184	090284	28.0	17.4	56.9	1.9	16.5	5665	3.1	142.5	4.6	480.0	96.7	58.5	<5	1635	.3	1.2	32450	6.6	776	<4	2215	119	<.08	10950	2.2	11950	139
37M-090284	3/64	OP IV	YES	310184	090284	28.4	14.8	56.6	1.5	16.9	5380	4.8	151.0	3.1	89.6	120.0	137.8	<5	1620	.35	1.7	33200	6.8	711	<4	2520	116	<.08	15400	2.2	12750	144
37O-090284	3/64	OP IV	NO	310184	090284	28.5	17.1	56.0	1.3	17.5	5335	3.1	150.0	4.6	454.6	84.8	73.1	<5	1475	.25	1.8	33000	6.5	689	<4	2365	120.5	<.08	13750	2.3	13600	143
38A-090284	1/16	OP IV	YES	090284	090284	29.0	18.0	56.0	2.1	15.7	5505	3.1	122.5	5.5	359.5	53.9	60.3	<5	1375	.25	.3	31150	6.2	654	<4	2000	111	<.09	6900	1.3	13000	130.5
38C-090284	3/64	OP IV	YES	060284	090284	28.5	17.4	56.4	2.0	16.0	5275	5.6	148.5	2.4	556.5	45.8	102.9	<5	1235	.4	1.3	30100	6.1	688	<4	1995	116	<.09	9440	2.1	10400	142
38D-090284	1/32	OP IV	YES	070284	090284	27.7	17.9	55.8	1.0	16.6	5305	6.2	149.0	4.7	836.3	69.3	119.8	<5	1360	.4	1.2	30450	6.2	947	<4	2000	132	<.09	10095	2.2	12600	142
38E-090284	1/32	OP IV	YES	140284	290284	28.1	17.7	56.6	1.7	16.8	5345	7.9	NA	<10	447.4	105.6	69.9	<5	2075	1.9	1.3	33000	10.2	1165	<4	2330	151.5	<.09	11900	2.5	13150	159
38F-090284	3/64	OP IV	YES	140284	290284	28.5	17.5	56.0	1.4	16.2	5265	6.3	NA	<10	371.4	58.4	62.7	<5	2055	1.4	1.4	31950	6.7	1065	<5	2355	168	<.09	12350	2.6	13100	174.5
38H-090284	1/16	OP IV	YES	210284	290284	27.8	16.4	56.0	1.5	16.3	5175	3.4	NA	<10	333.0	61.2	66.4	<5	2370	1.3	1.4	32200	6.6	1035	<4	2610	164.5	<.09	13700	2.8	13700	163
38I-090284	3/64	OP IV	YES	220284	290284	28.8	17.5	56.0	1.3	16.7	5265	2.4	NA	15.3	508.3	80.5	63.1	<5	2500	1.4	1.4	33250	6.8	1225	<5	2550	156.5	<.09	13100	2.6	14550	154.5
38J-090284	1/32	OP IV	YES	220284	290284	28.3	17.0	56.4	1.1	17.0	5125	2.9	NA	<10	375.0	62.7	56.9	<5	2280	1.4	1.6	33250	6.5	1190	<4	2520	181	<.09	13000	2.9	12900	168.5
39B-270384	1/16	OP IV	YES	060384	270384	32.2	12.1	60.3	2.1	19.3	5595	11.1	122	113.9	547.4	52.8	87.2	<5	1940	1.7	.6	40550	7.8	1075	<6	2500	168	<.1	9100	1.5	9050	166
39C-270384	3/64	OP IV	NO	070384	270384	35.2	18.6	62.7	1.8	19.2	5555	7.5	124	99.9	398.7	40.0	87.9	<5	2220	1.2	1.3	39050	7.3	1100	<7	2390	153.5	<.1	9950	2.2	9425	151
* 39B-270384	1/32	OP IV	YES	070384	270384	29.3	16.4	51.0	3.8	12.5	5170	6	120	NA	NA	NA	NA	<5	365	.85	.7	30700	9.6	397.5	<6	3040	112	<.1	11200	.81	7375	140
39F-270384	1/32	OP IV	NO	280284	270384	26.7	15.6	57.4	1.6	16.9	4895	7	143.5	<10	303.1	48.4	73.4	<5	2405	3.2	1.4	36100	7.4	1205	9	2350	161	<.1	10000	2.8	11500	153.5
39G-270384	1/16	OP IV	NO	070384	270384	29.5	17.8	56.2	1.3	16.3	5215	6.4	128	<10	468.7	31.2	73.7	<5	2135	1.6	1.5	34650	7.3	1070	9	2270	150.5	<.1	9800	2.7	9550	131.5
					AVERAGE	28.9	17.8	56.5	1.6	16.2	5362	5.3	127.1	28.0	421.9	52.9	83.5		1843	.8	.8	32634	7.4	876	9	2222	128.6	.1	9140	1.9	10820	151.2
					MAXIMUM	35.2	27.2	62.7	3.8	19.3	5780	22.5	151	189.7	836.3	120.0	137.8		2955	3.2	1.8	40550	13.2	1225	9	3040	181.0	.15	15400	2.9	18850	257
					MINIMUM	26.7	10.9	51.0	1.0	12.4	4895	1.6	82.4	.8	89.6	8.8	10.2		365	.2	.1	21350	4.9	398	9	1730	81.0	.1	5165	.81	4380	118
					NUMBER	37	37	37	37	37	37	37	32	30	36	36	31		37	37	31	37	37	37	2	37	37	4	37	37	37	37

* Quality control records indicate that this sample was a 1/32 pellet, however, analysis results are not consistent with other 1/32 samples.

Table 10: Results of chemical analyses of Oregon Moist Pellet fish food (OP II formula) from April 1983 to March 1984. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VIT C	PRODUCT DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% FIBER	% ASH	CALOR. VAL. (cal/g) OIL)	PEROX. VAL. (meq/kg OIL)	IODINE NO. (mg I/g oil)	VIT C (mg/ 100 g)	VIT E (ppm)	VIT A (ppm)	VIT B2 (ppm)	IODINE (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	K (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)
25A-060783	1/8	OP II	YES	060783	060783	28.6	16.4	53.9	3.6	11.9	5386	1.7	113.0	15.1	452.9	6.3	NA	<3	120	.12	.4	24200	9.0	264	<5	2855	116	<.1	11250	1.6	8070	144
25D-060783	3/32	OP II	YES	230683	060783	28.3	15.4	55.0	3.1	11.7	5402	2.7	115.8	18.5	453.0	12.0	NA	<3	192.5	.15	.2	26750	9.6	291	<5	3025	84.1	<.1	12000	1.6	10350	131
25E-060783	3/32	OP II	YES	240583	060783	27.8	17.8	53.9	3.9	12.8	5467	2.7	112.2	14.0	397.7	7.4	NA	<3	240	.22	.2	26350	11.9	294	<5	3015	122.5	<.1	11550	1.6	9990	155
26A-020883	1/8	OP II	YES	260783	030883	27.3	16.4	53.5	3.6	10.3	5534	4.2	113.9	34.9	519.7	40.3	73.4	< .5	61	.75	.2	21600	7.7	183	<3	2165	107.5	<.05	8180	1.0	6235	202.5
26B-020883	3/32	OP II	YES	260783	030883	27.8	16.3	53.7	2.8	10.8	5453	4.3	107.4	89.7	493.6	35.6	83.8	< .5	58	.4	.1	21550	8.0	190	<3	2215	110.5	<.07	8585	.9	6545	165
28C-240883	1/8	OP II	YES	100883	240883	27.9	17.8	52.3	3.6	10.7	5549	4.4	109.3	NA	362.0	51.6	76.4	<5	72	.85	<.1	27600	7.9	269	<3	2390	79.5	<.07	8470	.9	6135	115
28D-240883	3/32	OP II	YES	230883	240883	27.8	16.5	52.8	3.5	10.7	5578	5.9	111.9	NA	296.1	31.6	91.9	<5	72	.5	<.1	23900	9.0	211	<3	2405	110.5	<.07	9410	.9	8990	144
28E-240883	3/32	OP II	YES	110883	240883	27.7	17.1	51.7	3.3	10.6	5661	4.8	112.7	NA	319.7	45.5	84.9	<5	107	.5	<.1	26750	9.1	279	<3	2505	87.5	<.07	8460	.9	6950	123
29B-141083	3/32	OP II	YES	070983	141083	29.9	19.0	52.5	4.1	10.3	5650	4.5	110.1	49.6	434.0	27.6	82.7	<5	71.1	.2	<.1	17500	7.0	212	<3	1880	86.5	<.07	7630	1.0	6575	131.5
29C-141083	1/8	OP II	YES	060983	141083	27.0	18.2	52.6	4.4	10.4	5574	3.6	111.7	140.2	454.4	24.7	102.9	<5	61.8	.2	<.1	17750	7.0	200	<3	1895	86.4	<.06	7895	1.1	6735	122
29D-141083	1/8	OP II	NO	240883	141083	25.7	16.2	53.7	4.2	10.5	5460	6.7	111.3	20.9	444.7	20.8	108.3	<5	63	.2	<.1	20900	9.2	401	<3	2110	111	<.06	8990	1.2	8170	162.5
29E-141083	1/8	OP II	YES	210983	141083	26.7	18.5	51.7	3.4	9.9	5622	5.6	111.2	133.6	382.8	16.6	97.9	<5	67.7	.2	<.1	21250	7.8	184	<3	2150	107	<.07	10300	1.1	7955	131
29F-141083	3/32	OP II	YES	190983	141083	26.9	20.6	51.0	4.0	10.3	5594	4.0	110.4	137.4	489.2	27.5	112.2	<5	67.9	.3	<.1	19350	8.0	218	<3	1980	95.45	<.06	8205	1.1	6895	130.5
29G-141083	1/8	OP II	YES	240883	141083	26.0	18.2	52.9	4.1	11.3	5585	3.0	110.0	75.5	395.8	37.5	107.7	<5	87.3	.3	<.1	20100	9.0	240	<3	1995	116.5	<.07	8390	1.1	7825	157.5
30B-141083	1/8	OP II	NO	101083	141083	37.7	20.1	60.5	3.4	14.0	5424	5.1	119.2	17.9	578.0	31.7	92.6	<5	169	.2	<.1	20250	20.1	269	<3	1805	90.85	<.06	7420	1.6	6065	188
31B-141083	3/32	OP II	YES	141083	141083	28.1	18.9	53.0	3.9	15.2	5595	4.0	115.8	92.6	522.9	18.8	90.2	<5	79.9	.2	<.1	18350	14.3	222	<3	1695	93.9	<.07	7285	1.4	6170	151.5
34A-211083	3/32	OP II	YES	051283	201283	26.8	16.4	51.8	3.8	11.4	5425	1.7	120.5	262.4	551.2	38.1	111.5	<5	95.5	.1	<.2	26850	8.8	224	<4	3035	104.5	<.09	10550	1.2	7090	128
34B-201083	1/8	OP II	YES	121283	201283	26.9	15.6	52.6	4.1	12.1	5340	1.8	116.0	260.2	561.7	9.6	102.8	<5	87.8	.1	<.2	18550	8.6	182	<4	2725	112.5	<.09	10500	1.1	16150	130
34C-211083	1/8	OP II	NO	071283	201283	29.0	16.8	52.6	1.8	10.6	5515	2.5	125.5	64.6	519.3	30.9	100.3	<5	83.3	.1	<.2	20900	8.8	188	<4	2955	97.3	<.09	10500	1.2	9880	124
36B-090184	1/8	OP II	NO	050184	090184	29.4	17.7	37.8	4.1	11.5	5600	9.6	116.5	8.1	332.4	35.5	114.7	<5	170.5	.1	<.2	20150	10.2	242	<4	3195	123.5	<.09	11750	1.0	12700	157.5
36E-090184	5/32	OP II	YES	050184	090184	28.0	17.9	52.1	3.6	11.5	5526	7.8	113.5	160.0	245.5	23.5	101.9	<5	90.1	.1	<.2	19700	9.3	200	<5	3215	110	<.09	11600	1.0	12750	152
36F-270184	1/4	OP II	YES	090184	270184	27.1	17.5	51.6	3.3	16.0	5310	3.1	117.0	104.9	334.0	20.4	72.6	<5	170	.4	.2	20950	8.7	208	<4	2965	107.5	<.09	11050	1.3	13650	124.5
36G-270184	3/16	OP II	YES	090184	270184	27.0	18.3	52.6	3.2	11.4	5555	3.0	116.0	46.3	452.6	24.5	93.6	<5	160	1.45	.2	20550	8.4	202	<4	2525	97.4	<.08	9395	.9	10400	120.5
36H-270184	1/8	OP II	YES	110184	270184	27.9	16.1	53.8	3.1	11.8	5455	10.3	116.0	11.1	297.9	25.7	65.6	<5	170	1.45	.3	21950	9.7	234	<5	3470	126	<.1	14200	1.2	14450	142.5
36I-270184	3/32	OP II	YES	120184	270184	28.9	16.9	54.6	3.1	10.7	5575	5.5	119.0	98.3	428.2	28.3	98.7	<5	175	1.1	<.3	20200	8.5	201	<5	3490	117.5	<.09	14450	1.2	14100	125
37B-270184	1/8	OP II	YES	240184	270184	27.0	14.9	52.3	3.6	16.0	5325	3.7	132.5	50.4	491.3	47.5	98.9	<5	330	.5	.4	24350	9.2	335	<5	3055	114	<.1	11050	1.6	8820	134
38B-090284	3/32	OP II	YES	010284	090284	29.2	16.8	50.1	3.4	12.4	5395	5.0	141.5	6.3	817.0	63.4	75.9	<5	235	.15	.8	27500	8.4	387	<4	3015	103.5	<.08	13050	1.6	7160	136.5
38E-090284	3/32	OP II	YES	150284	290284	26.9	14.4	52.6	3.8	12.1	5390	3.8	NA	14.9	385.7	31.5	65.5	<5	145	.4	1.2	26750	9.6	352	<4	3830	118.5	<.09	17300	2.1	9315	156.5
38F-090284	3/32	OP II	YES	230284	290284	28.8	16.0	51.7	3.2	12.7	5335	4.4	NA	<10	335.2	77.8	65.2	<5	430	.5	.5	32900	8.9	439	<4	3550	154.5	<.08	13700	1.6	6575	198
38H-090284	1/8	OP II	NO	270284	290284	28.8	16.9	52.8	3.9	10.4	5255	3.3	NA	<10	70.0	49.1	66.8	<5	120	.3	.2	21000	9.0	202	<4	3305	98.2	<.09	12850	1.2	12400	140.5
39E-270384	3/32	OP II	YES	080384	270384	27.4	15.2	50.1	4.3	13.0	5640	6.4	117	93.3	438.1	35.6	76.7	<5	205	.5	.65	31400	9.9	401	<7	3140	115	<.1	12000	1.25	7850	140
39I-270384	5/32	OP II	NO	140384	270384	27.5	15.6	49.7	3.4	12.0	5115	7.4	120	<10	549.2	25.4	71.1	<5	55	.7	1	29000	9.8	280	<6	2905	100	<.1	12700	2.2	7885	148.5
39J-270384	1/8	OP II	YES	070384	270384	28.7	15.8	52.1	3.5	12.5	5125	4.4	120	59.5	369.5	47.9	30.0	<5	340	.75	.6	30850	9.2	386.5	<6	3030	112	<.1	11100	1.8	7105	136.5
					AVERAGE	28.1	17.1	52.3	3.6	11.8	5472	4.6	116.6	76.8	431.8	32.7	87.9		139	.4	.5	23181	9.6	261		2684	106.3		10583	1.3	8956	144.6
					MAXIMUM	37.7	20.6	60.5	4.4	16.0	5661	10.3	141.5	262.4	817.0	77.8	114.7		430	1.45	1.2	32900	20.1	439		3830	154.5		17300	2.2	16150	202.5
					MINIMUM	25.7	14.4	37.8	1.8	9.9	5115	1.7	107.4	6.3	70.0	6.3	30.0		55	.1	.1	17500	7	182		1695	79.5		7270	.89	6065	115
					NUMBER	34	34	34	34	34	34	34	31	28	34	34	31		34	34	16	34	34	34		34	34		34	34	34	34

able II: Results of chemical analyses of Oregon Moist Pellet fish food (OM-3 formula) from April 1982 to March 1986. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VIT C	PRODUCT DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% ASH	% FIBER	PEROX. VAL. (meq/kg OIL)	IODINE NO. (mg I/ g oil)	% FREE FATTY ACIDS	VIT C (mg/ 100 g)	VIT E (ppm)	VIT A (ppm)	VIT B2 (ppm)	CALOR. VAL. (cal/g OIL)	IODINE (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	K (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)
-200482	NASH	OM 3	NO	030382	290482	20		51.6	13.6										4.9	81	<8	<.6	33000	6.25	400	<2	2300	131	.08	4675	1.6	7125	192.5
-200482	NASH	OM 3	NO	040182	290482	17		51.2	14.8										4	67.5	<8	<.6	33011	5.4	201	<2	2226	105	.04	3677	1.2	7957	162
6-020883	NASH	OM 3	NO	180783	030883	17.1	16.1	53.4	13.2	2.2	NA	120.9		35.8	663.8	221.4	72.3	5385	<5	160	.2	<.1	35800	5.6	220	<3	1740	50.5	<.06	6955	1.1	4490	99.5
F-201083	NASH	OM 3	YES	121283	201283	22.2	15.1	56.9	14.7	1.7	2.5	117.5		181.6	447.7	27.4	98.5	5195	<5	122	.15	<.2	32150	9.2	247	<4	2075	103	<.09	9620	1.6	10950	154.5
A-090184	NASH	OM 3	YES	090184	090184	21.1	14.0	57.8	12.8	1.3	2.5	116.8		103.5	352.2	20.2	75.8	5499	<5	95.8	.15	.2	25700	9.2	189	<4	2065	114	<.09	9035	1.2	14400	136
R-090284	NASH	OM 3	YES	300184	090284	22.6	16.4	55.7	14.3	1.6	2.4	146.5						5480	<5	150	.35	1.3	32850	6.8	230	<4	2245	99	<.08	13850	2.6	14700	137.5
L-090284	NASH	OM 3	NO	270284	290284	20.7	18.0	55.5	12.7	1.4	5.5	NA						5755	<5	120	.7	1.0	31000	6.0	274	<4	2300	96.9	<.08	12650	2.0	13600	137
-260484	NASH	OM 3	YES	230484	260484	20.3	17.6	55.7	11.2		16.2	115		199.0	340.0	36.0	80.6			165	1.9	.2	32000	5.8	205	<6	1735	71	<.1	5800	2.7	6840	111
-051184	NASH	OM 3	NO	151084	051184	19	15.3	55.8	12.7					77.2																			
1-171284	NASH	OM 3	YES	171284	171284	22.2	17.9	55.9	11.8		4.9	111		277.2						260	2.6	.3	34750	11.2	298	<4	2375	106	<.08	9985	1.7	6915	300
0-210185	NASH	OM 3	YES	140185	210185	21.7	17.8	55.2	10.5		4.4	110		265.9						190	.7	.1	21800	6.9	176	<3	1795	69	<.06	7945	.9	3915	174
2-210185	NASH	OM 3	NO	140185	210185	22.4	18.3	51.7	10.3		3.9	113		50.0						145	.7	<.1	21600	5.4	168	<3	1775	51	<.06	7765	1	4220	124
S-260285	NASH	OM 3	NO	110285	260285	19.9	16.7	54.6	12.2		10	122								220	1.1	.5	34550	6.8	255	<4	2240	55	<.08	10700	2.1	6060	166
2-260285	NASH	OM 3	YES	250285	260285	23	18.2	56.2	11.9		15.5	135								230	1.3	.3	33100	6.2	280	<4	2060	56	<.08	9145	1.5	5540	183
66	NASH	OM 3	NO	181185	251185	21.8	16.7		12		5.4	118.3	11.9	20.5																			
78	NASH	OM 3	YES	060186	100186	23.3	16.7		10.6		4.6	132	6.5	29.5																			
79	NASH	OM 3	NO	060186	100186	20.7	15.9		10.7		8.7	137.9	7.3	15																			
87	NASH	OM 3	YES	030286	040286	20.2	16.4		11.3		19.8	104.7	6	147.2																			
92	NASH	OM 3	YES	120286	250286	18	16.1		11.7		13.5	141.8	2.6	180.4																			
					AVERAGE	20.7	16.7	54.8	12.3	1.6	8.0	122.8	6.9	121.8	+50.9	76.2	81.8	5463	4.5	154.3	.9	.5	30870	7.0	242		2072	85	.06	8600	1.6	8824	159.8
					MAXIMUM	23.0	18.3	57.8	14.8	2.2	19.8	146.5	11.9	277.2	663.8	221.4	98.5	5755	4.9	260.0	2.6	1.3	35800	11.2	408		2375	131	.08	13850	2.7	10950	300.0
					MINIMUM	17.0	14.8	51.2	10.3	1.3	2.4	104.7	2.6	15.0	340.0	20.2	72.3	5195	4.0	67.5	.1	.1	21600	5.4	168		1735	50	.04	3677	.9	3915	99.5
					NUMBER	14	17	14	19	5	15	15	5	13	4	4	4	5	2	13	11	8	13	13	13		13	13	2	13	13	13	13

Table 12: Results of chemical analyses of Oregon Moist Pellet fish food (OP IV formula) from April 1984 to March 1985. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VIT C	PROD DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% ASH	PEROX. VAL. (meq/kg OIL)	IODINE NO. (eg I/g oil)	VIT C (mg/100 g)	VIT E (ppm)	VIT A (ppm)	VIT B2 (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	P (ppm)	K (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)
1-260484	3/64	OP IV	NO	270384	260484	26.8	19.1	53.0	16.1	4	127	5.6	341.4	24.2	100.7	2220	1.7	1.0	32150	13.1	1300	<7	2140	173	<.1	20350	9250	3.6	8870	160.5
2-260484	1/16	OP IV	NO	170384	260484	26.4	19.3	52.9	15.6	9.1	126	23.1	325.0	28.5	100.0	2055	2.7	.8	32700	6.8	1103	<6	2120	155	<.1	19850	8550	3.4	8075	146.5
4-260484	1/32	OP IV	YES	040484	260484	27.8	16.6	56.0	16.3	7.1	128	126.6	338.2	32.5	102.2	1810	1	.9	33650	7.3	1175	<7	2170	171	<.1	21200	9100	4.2	8715	154
5-260484	3/64	OP IV	YES	040484	260484	26.9	18.7	54.4	16.0	9.3	129	101.0	467.6	28.0	73.6	1710	1.2	1.0	31900	7.25	1205	<6	2090	175	<.1	20300	8950	4	8475	153.5
8-260484	3/64	OP IV	NO	020484	260484	26.9	18.5	54.0	15.5	9.7	122	19.3	405.1	30.1	87.0	1710	1.6	1.1	31100	7.85	984	<6	2165	209	<.1	20150	9150	4.9	7735	204
9-260484	1/32	OP IV	NO	050484	260484	26.7	18.6	54.6	16.6	9.7	146	22.2	488.9	64.7	65.4	1725	1.5	1.5	31750	7.5	1125	<7	2110	200	<.1	20750	9650	5.6	9010	181
11-260484	1/16	OP IV	YES	100484	260484	25.6	17.2	48.7	14.4	10.1	124	187.6	417.7	147.8	62.8	1535	1.65	.7	26150	8.8	907	<6	2920	163	<.1	18600	10200	3.5	7065	145
13-260484	3/64	OP IV	NO	020484	260484	26.8	19.8	52.3	16.0	9.9	124	14.1	433.2	30.5	64.1	2195	2.4	1.2	30950	7.7	1245	<6	2200	188	<.1	19900	8800	4.2	7815	180.5
14-260484	1/16	OP IV	NO	090484	260484	26.2	19.5	54.1	15.9	9.1	124	22.9	465.2	32.1	68.3	2430	2.5	1.0	29400	7.3	1225	<5	2115	161	<.1	19500	8900	3.3	8270	143
16-260484	1/32	OP IV	YES	110484	260484	26.1	18.0	53.9	16.5	13.1	130	141.3	332.1	25.6	61.0	1620	.7	1.1	32200	7.4	1295	<7	2130	188	<.1	20450	8750	5.3	8185	175
21-260484	3/64	OP IV	YES	180484	260484	26.8	18.6	53.8	17.2	12	117	275.8	338.9	40.0	85.6	1810	1.9	.8	33300	7.2	1027	<7	2195	181	<.1	20500	9150	4.4	12650	178
22-260484	1/32	OP IV	YES	180484	260484	25.5	18.1	54.9	15.7	14.1	125	253.2	323.4	33.0	62.3	1445	1.7	1.0	32450	7.7	1010	<6	2055	178	<.1	20300	9650	5.2	9490	175
23-260484	1/16	OP IV	YES	190484	260484	24.5	19.2	52.7	16.0	10	116	273.2	366.8	58.3	70.4	1425	1.6	.7	30400	7.4	861	<6	2070	171	<.1	18900	8600	4.1	12100	170
25-260484	3/64	OP IV	YES	250484	260484	28	16.7	53.1	15.0	14.5	128	264.7	464.9	26.2	91.9	1200	1.6	1.0	30800	6.9	917	<7	2140	164	<.1	19500	9700	4.9	8870	170
30-170584	1/16	OP IV	NO	260384	170584	28.2	20.3	53.6	15.3	8.6	120	20.3	360.9	79.0	69.2	2685	2.8	.8	30700	8.3	1495	<4	2050	170	<.09	18700	7600	2.1	7845	160
31-170584	3/64	OP IV	NO	180384	170584	26.2	17.8	54.5	16.0	9.8	127	18.0	285.4	45.1	53.7	2375	2.5	1.2	32000	8	1435	<5	2125	179	<.09	20000	9100	2.6	9105	177
35-170584	1/32	OP IV	NO	080584	170584	24.4	18.8	54.6	14.2	6.5	120	63.8	351.6	76.1	64.7	2865	2.8	.3	31950	7.2	1355	<4	1950	153	<.08	18150	5200	1.5	5120	163
36-170584	3/64	OP IV	NO	080584	170584	27	20.8	57.3	13.4	6.2	121	59.9	289.6	32.3	74.0	2500	3	.3	31250	7	1220	<4	1885	155	<.08	17950	5050	1.6	5175	166
38-170584	1/16	OP IV	YES	100584	170584	27.5	19.2	54.8	13.5	5.2	125	174.3	331.9	42.8	69.4	2280	2.8	.5	30700	7.4	1065	<4	2100	153	<.09	18150	6150	2	5435	161
39-170584	1/16	OP IV	NO	100584	170584	26	18.9	55.5	14.2	8.7	126	41.8	393.2	22.8	64.0	2415	1.8	.5	32750	7.7	1140	<4	2150	164	<.08	19550	5750	2	5160	173
41-170584	3/64	OP IV	YES	150584	170584	27.6	18.6	57.3	13.4	9.2	120	185.4	295.4	39.1	52.7	2255	1.7	<.2	28500	7.4	1125	<5	1915	146	<.09	16350	6000	1.5	4975	152
42-170584	1/32	OP IV	YES	150584	170584	27.8	19.7	56.0	14.8	6.2	121	210.0	341.7	34.1	54.9	3795	2.3	.2	29400	7.4	1555	<4	2070	157	<.08	16600	5700	1.6	5135	150
43-170584	1/16	OP IV	NO	230584	140684	28.2	20.6	55.0	14.8	9.7	123	127.4	322.0	37.3	55.6	2480	2.7	.6	31750	7.3	1140	<4	1930	145	<.08	17950	5400	2	5745	151
50-140684	1/16	OP IV	YES	040684	140684	28.7	19.6	54.3	14.0	8.6	127	18.4	238.3	25.4	55.0	2050	2	.7	30900	8.2	1200	<4	2115	162	<.09	18900	7250	2.3	7125	200
52-140684	1/16	OP IV	YES	060684	140684	27	19.6	53.4	14.9	5.6	106	97.7	133.7	28.4	92.7	2530	2	.3	34950	7.6	1830	<5	2120	242	<.09	20500	6800	1.9	6605	191
54-140684	1/32	OP IV	YES	060684	140684	28.5	21.5	55.7	15.2	6	116	177.9	233.1	35.0	89.5	2570	2.7	.5	34900	8.2	1730	<4	2150	249	<.08	20250	6650	1.8	6485	199
55-140684	1/16	OP IV	NO	060684	140684	25.8	19.1	51.9	14.6	5.8	127	174.3	353.9	50.8	47.1	2565	1.4	.5	33500	8.6	1785	<4	2010	230	<.09	19100	5800	1.7	8080	190
56-140684	1/16	OP IV	YES	180684	180784	24	20.3	53.9	14.2	7.3	118	21.7	171.8	52.5	59.4	2575	2.8	.3	35950	9	1750	<4	2145	143	<.09	19850	6100	1.4	5435	187
64-180784	3/64	OP IV	YES	180684	180784	29.7	25.5	54.6	14.2	6.6	123	50.2	437.1	59.7	79.5	2760	2.8	.5	32300	7.5	2150	<5	2105	169	<.09	19000	6450	1.7	5760	157
65-180784	1/16	OP IV	YES	180684	180784	30.7	20.9	55.6	14.6	6.2	128	43.6	346.2	59.6	97.2	2395	2.2	.5	33950	7.2	1800	<5	1995	186	<.1	19350	6050	1.7	5825	145
78-060984	1/16	OP IV	YES	080684	060984	29.1	17.9	56.6	14.2	4.8	113	72.1	363.2	52.3	76.4	2235	1.8	.6	34000	5.5	1160	<5	1940	162	<.09	18850	6000	.8	6400	147
83-060984	1/16	OP IV	NO	310884	060984	28.7	17.1	56.0	14.0	5.2	109	32.8	230.0	60.3	72.3	2740	3.3	.6	33400	7.3	2200	<4	2000	114	<.08	18250	6100	.8	6955	138
92-101084	1/6	OP IV	YES	041084	101084	28.2	18.5	59.7	14.2	12.6	132	199.4	433.0	79.5	27.9	2095	2.1	.7	30650	7.9	1125	<4	2145	130	<.09	19050	8135	3.2	9110	163
97-051184	3/64	OP IV	YES	161084	051184	27.1	18.0	56.7	15.2	4.7	117	158.8	525.5	30.7	58.8	2795	3.3	1.0	32750	8.1	1345	<5	2560	175	<.09	19200	9560	2.1	9530	149
98-051184	3/64	OP IV	NO	161084	051184	25.8	18.1	57.3	15.0	5.8	118	77.9	501.9	32.3	80.9	2670	2.9	1.0	33750	7.9	1330	<5	2500	179	<.09	19300	9620	2.2	9780	149
99-051184	1/32	OP IV	YES	161084	051184	27.5	19.3	56.4	14.6	5.3	119	274.9	526.5	49.4	63.8	2340	3.8	1.0	32000	7.8	1145	<5	2315	175	<.09	18450	8835	2.1	8770	142
100-051184	1/32	OP IV	NO	161084	051184	27.8	18.0	57.3	14.7	3.2	118	68.7	482.5	41.6	66.4	2525	4.2	1.0	31600	7.8	1305	<5	2335	189	<.09	18200	8675	2.3	8600	141
104-051184	1/16	OP IV	NO	181084	051184	28.8	19.4	57.3	14.7	5.8	115	66.4	525.1	41.0	61.6	2130	2.9	.9	30500	7.8	1060	<4	2125	92	<.09	18000	8050	1.6	9075	145
106-261184	1/32	OP IV	YES	141184	261184	28.4	20.5	57.5	13.8	3.7	119	200.1	414.5	35.8	70.3	3115	4.4	.5	34300	7.1	1220	<5	2590	118	<.09	20450	10355	.4	8220	154
107-261184	3/64	OP IV	YES	141184	261184	27.8	21.9	56.8	13.7	5.2	118	33.1	401.0	38.4	62.3	2920	3.8	.5	34150	6.1	1140	<4	2435	105	<.08	19300	10070	1.1	8055	126
113-171284	3/64	OP IV	YES	291184	171284	30.9	19.5	58.9	14.0	5.2	110	224.5	479.0	23.6	79.8	2885	2.4	<.2	33950	11.1	1560	<4	2325	137	<.08	18550	8820	<.08	7395	181
114-171284	1/32	OP IV	YES	291184	171284	31.2	20.1	58.7	14.2	5	107	193.3	276.3	24.7	76.8	3090	2.9	<.2	34100	11.5	1700	<4	2460	144	<.08	18900	8800	.09	7250	185
116-171284	3/64	OP IV	YES	031284	171284	32.1	20.2	59.4	13.8	5.8	105	199.4	366.1	25.2	62.9	3000	3.1	.2	33750	10.9	1850	<4	2540	159	<.09	19050	8930	.8	7265	202
117-171284	1/32	OP IV	YES	041284	171584	31.1	20.6	57.8	13.6	6.4	111	208.0	253.3	25.3	58.3	2940	2.9	<.2	31700	10.10	1555	<5	2365	111	<.09	17450	8350	.6	7005	213
126-171284	1/16	OP IV	YES	131284	171284	29.9	21.8	56.9	13.6	6.7	108	173.9	365.3	26.7	54.5	2695	2.6	<.2	32100	14.5	1500	<4	2165	153	<.08	16850	8010	.7	7135	217
128-171284	3/64	OP IV	NO	141284	171284	29.2	21.0	56.4	14.5	5.8	108	41.1	614.1	24.2	47.7	2290	3.3	.3	33100	8.1	1175	<4	1935	127	<.08	18100	7150	.5	6280	168

Table 12 con't: Results of chemical analyses of Oregon Moist Pellet fish food (OP IV formula) from April 1984 to March 1985. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VIT C	PROD DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% ASH	PEROX. VAL. (meq/ kg OIL)	IODINE NO. (eg I/ g oil)	VIT C (mg/ 100 g)	VIT E (ppm)	VIT A (ppm)	VIT B2 (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	P (ppm)	K (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)
132-210185	3/64	OP IV	YES		210185	28.6	20.4	56.7	13.7			192.0																		
133-210185	1/32	OP IV	YES	181284	210185	28.1	20.6	55.8	13.9			169.1																		
134-210185	1/32	OP IV	YES	191284	210185	30.2	20.2	55.0	15.2			156.4																		
135-210185	1/32	OP IV	NO	020185	210185	29.6	19.7	57.4	14.9	6	101	20.7	382.4	59.8	58.9	2215	1.4	.3	22550	5.1	1135	<3	1640	129	<.06	12750	5400	.5	6055	114
136-210185	3/64	OP IV	NO	281184	210185	28.6	19.2	57.1	13.9	4.6	113	38.4				2205	.6	.3	22250	6.80	921	<4	1750	96.8	<.07	12750	5400	1.1	4740	100
137-210185	1/32	OP IV	NO	071184	210185	28.5	19.7	57.5	15.1	5.9	106	29.7	352.2	55.0	82.2	2100	2.3	.45	24000	5	850	<3	1650	97.3	<.07	12950	5650	1	5325	100
138-210185	3/64	OP IV	NO	271284	210185	29.1	20.2	54.0	15.4	5.5	107	17.2	258.4	69.7	64.7	2100	2.4	.35	22350	4.9	942	<3	1590	113	<.06	12100	5050	.8	9120	101
139-210185	1/16	OP IV	NO	070185	210185	27.6	19.2	54.8	15.3	4.3	126	7.0	375.0	66.7	65.3	2090	.8	.25	22700	4.9	1011	<3	1615	130	<.06	12300	5250	.9	9470	104
143-210185	1/32	OP IV	YES	170185	210185	29.8	21.8	56.4	13.7	4.7	118	131.5	157.7	78.2	49.3	2075	2.2	.2	20750	5.4	1400	<3	1725	52	<.06	11650	6135	.9	4335	105
144-210185	1/32	OP IV	NO	170185	210185	29.4	21.7	56.8	13.5	4.5	119	7.2	423.7	66.3	58.9	2045	2.1	.2	20850	5.3	1400	<3	1715	51	<.06	11500	6155	.9	4280	110
146-040285	1/32	OP IV	YES	210185	040285	30.3	22.5	54.7	13.8	<1	124	191.7	398.4	66.9	87.9	3100	4.4	.35	27600	9.2	2450	<4	2185	70	<.08	16050	7770	.5	5585	178
152-040285	1/16	OP IV	NO	230185	040285	30.8	21.7	54.3	14.0	<1	124	30.5	157.1	92.9	89.6	2620	2.6	.3	24600	6.8	1510	<4	2000	154	<.08	14250	7000	1.3	5120	195
153-040285	1/32	OP IV	YES	300185	040285	31.4	22.2	55.0	13.7	<1	122	248.4	245.8	67.6	54.5	2475	3.8	.3	28600	5.1	1715	<5	1805	51	<.09	15450	6000	.5	3420	111
160-260285	1/16	OP IV	NO	150285	260285	30	22.3	54.3	14.3	8.5	115	205.3	365.6	22.6	53.6	2335	1.2	.3	30850	5.8	735	<4	2130	63	<.09	16850	8345	2	5570	154
163-260285	3/64	OP IV	YES	250285	260285	29.5	19.1	56.2	13.9	14.3	116	168.9	329.8	168.9	63.8	2120	1.2	.25	28800	6.2	852	<4	2115	73	<.08	16200	7500	1.5	4820	190
164-260285	1/32	OP IV	YES	260285	260285	28.8	20.5	55.1	14.5	14.2	107	171.2	379.5	160.5	75.0	1960	1.2	.4	29250	6.2	754	<4	1950	65	<.08	15950	7250	2	4930	171
167-050385	1/16	OP IV	YES	270285	050385	29.2	17.5	56.9	14.3	6.7	111	166.1	396.8	160.6	60.2	2030	1.8	.35	28300	6.7	998	<4	2080	80	<.08	16650	9065	.4	5805	179
168-050385	1/16	OP IV	NO	270285	050385	30.6	19.2	57.9	14.6	7.7	127	10.1	179.8	166.8	64.7	2250	1.2	.35	29800	6.7	1270	<5	2085	103	<.1	17050	7250	1.7	4905	172
176-050385	1/32	OP IV	NO	040385	050385	29.3	21.1	55.4	15.1	14.9	123	3.4	430.4	103.7	70.9	2160	2.1	.45	28550	8.60	1000	<4	1930	71	<.09	15850	6900	1.9	5360	209
177-050385	3/64	OP IV	NO	040385	050385	30	20.6	57.7	13.5	8.7	110	95.4	75.6	170.0	71.2	1785	1.7	.3	27250	8.2	844	<5	1985	68	<.1	15650	7150	1.8	4560	202
181-190385	1/32	OP IV	YES	110385	190385	30.4	18.1	58.0	12.4	16.5	110	159.1	185.3	16.1	66.2	2125	1.5	.45	26650	6.6	959	<4	2095	71	<.08	15550	9230	1	7195	175
183-190385	3/64	OP IV	YES	130385	190385	28.5	18.3	57.2	13.7	12	102	181.4	427.1	28.0	80.8	2095	1.9	.45	26600	7.2	851	5	2305	66	<.09	15350	9150	.8	8060	185
184-190385	1/16	OP IV	YES	130385	190385	28.7	19.8	57.1	16.0	15.8	105	163.4	431.4	15.0	71.1	2305	1.6	.35	24900	6.7	893	<4	2235	71	<.08	14350	8620	.7	7345	177
192-260385	1/16	OP IV	NO	160385	260385	28.1	21.6	57.9	14.2	13.8	122	7.4				2075	1.9	.7	23400	7.9	897	5	2160	67	<.09	14200	8250	.8	7020	189
193-260385	3/64	OP IV	YES	180385	260385	27.6	20.3	56.9	14.6	13.7	128	161.7	473.1	20.6	98.7	2110	2.6	.85	25600	7.80	889	6	2210	60	<.07	15800	8405	1	7645	158
195-260385	1/16	OP IV	YES	190385	260385	29.4	22.8	56.8	14.2	17.5	129	168.0				2130	2.2	.6	25850	6.8	928	4	2145	56	<.09	15300	6750	1.1	6605	180
196-260385	1/32	OP IV	YES	190385	260385	28.2	20.5	56.7	14.3	15.7	112	140.7	437.2	18.9	94.0	2180	2.9	.7	24900	6.6	916	<5	2135	55	<.09	14850	7700	.6	7340	163
197-260385	1/32	OP IV	NO	110385	260385	29.5	20.6	55.6	13.9	19.1	117	12.2				2125	1.9	.55	25200	7	960	<4	2035	62	<.08	14500	7600	.7	6195	184
					AVERAGE	28.3	19.8	55.7	14.6	8.5	119	112.8	357.8	53.0	69.3	2313	2.3	.6	29888	7.6	1254	5	2107	134		17500	7656	1.9	7042	162.8
					MAXIMUM	32.1	25.5	59.7	17.2	19.1	146	275.8	614.1	170.0	102.2	3795	4.4	1.5	35950	14.5	2450	6	2920	249		21200	10355	5.6	12650	217
					MINIMUM	24.0	16.6	48.7	12.4	3.2	101	3.4	75.6	15.0	27.9	1200	.6	.2	20750	4.9	735	4	1590	51		11500	5050	.09	3420	100
					NUMBER	76	76	76	76	70	73	76	69	69	69	73	73	66	73	73	73	4	73	73		73	73	71	73	73

Table 13: Results of chemical analyses of Oregon Moist Pellet fish food (OP II formula) from April 1984 to March 1985. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VITAMIN C YES/NO	PROD DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% ASH	PEROX. VAL. (meq/kg OIL)	IODINE NO.mg/100g (mg I/g oil)	VIT C (ppm)	VIT E (ppm)	VIT A (ppm)	VIT B2 (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	P (ppm)	K (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)
7-260484	3/32	OP II	NO	050484	260484	25.9	17.4	48.2	12.1	8.3	127	53.3	451.1	21.5	96.5	205	1.4	.7	26900	9.8	306	<7	3055	131.5	<.1	19350	11000	2.6	6800	156
10-260484	3/32	OP II	YES	100484	260484	24.6	16.3	51.2	11.4	5.1	126	245.5	636.3	128.2	59.9	165	1.7	.7	24300	9.6	267	<6	3085	108.5	<.1	18500	11050	2.6	6375	134.5
12-260484	3/32	OP II	NO	100484	260484	27.1	18.2	53.1	14.0	11.1	124	75.7	449.4	137.3	65.1	1100	1.7	1.0	27950	8.4	752	<6	2465	172	<.1	19500	9700	4.4	7505	169.5
15-260484	1/8	OP II	NO	130384	260484	24.5	16.6	49.3	11.7	7	124	60.1	339.1	193.8	59.7	165	.9	.7	26000	11	274	<6	3055	131.5	<.1	19250	11000	3.2	6265	150
17-260484	3/32	OP II	YES	160484	260484	25	17.7	51.1	11.3	7.1	114	248.5	386.9	72.0	60.4	280	1.1	.5	24500	8.95	311	<6	2845	118.5	<.1	18100	11000	2.9	7655	139.5
19-260484	5/32	OP II	YES	170484	260484	23.8	17.5	50.3	10.9	7.1	117	292.4	336.4	39.4	64.3	215	.4	.3	23500	9.8	264	<5	2910	132	<.1	17750	10850	2.3	7895	156
20-260484	1/8	OP II	YES	170484	260484	26.6	17.7	52.7	10.1	5.1	115	276.8	456.5	46.0	74.4	110	.4	.3	20650	10	217	<7	2930	129	<.1	16550	11000	2.4	7755	159
28-170584	3/32	OP II	NO	270384	170584	28	17.8	52.5	9.9	8.7	117	56.8	252.4	24.6	57.1	245	.8	.3	22800	10	290	<4	2705	114	<.09	16350	9015	1.3	4565	159
29-170584	1/8	OP II	NO	300384	170584	26.9	17.8	50.3	9.3	7.7	115	64.3	249.7	40.8	72.5	140	1	.3	22700	9.4	216	<5	2880	100	<.08	16400	8870	1.2	3975	134
32-170584	3/32	OP II	YES	300384	170584	27.4	17.2	51.7	9.5	6.2	115	329.6	365.8	38.6	68.9	140	.7	.3	23100	10.7	231	<4	2875	159	<.09	16600	9025	1.3	4175	190
34-170584	3/32	OP II	YES	070584	170584	27	14.9	52.6	9.7	7.5	118	222.7	394.0	65.3	69.5	135	.4	.2	23700	10.3	216	<4	3005	118	<.08	16900	9470	1.3	4205	161
37-170584	3/32	OP II	NO	090584	170584	25.4	16.4	53.8	9.4	6	117	73.9	341.2	37.9	80.1	125	1.7	.2	22550	10.5	184	<4	2910	127	<.09	16300	8785	1.4	4145	180
45-170584	3/32	OP II	YES	170584	170584	25	16.4	50.5	9.6	10.8	143	244.9	263.9	22.3	65.4	280	1.2	.3	19950	9.7	201	<4	2685	111	<.08	14900	10250	1.6	5595	170
47-140684	1/8	OP II	NO	210584	140684	26.4	17.1	50.8	9.8	5.9	127	44.3	501.0	20.0	79.6	255	1.8	<.2	20200	9.1	265	<5	2975	118	<.1	16100	10750	1.3	6420	160
48-140684	3/32	OP II	YES	220584	140684	26	17.8	53.2	9.2	6.3	129	223.9	339.2	23.5	67.4	195	1.2	<.2	20200	9.6	263	<5	3050	112	<.1	16250	10800	1.2	7025	158
53-140684	3/32	OP II	YES	050684	140684	26.5	19.5	49.9	9.8	6.1	117	222.6	148.4	26.1	83.4	145	1.6	.3	20500	10.6	253	<5	2945	121	<.1	15750	10125	1.4	5750	188
57-140684	3/32	OP II	NO	060684	140684	27	16.4	51.6	9.6	6.5	119	67.4	266.8	40.4	61.2	175	1.3	.2	22300	12.8	259	<5	3060	121	<.09	16300	10600	1.2	4970	198
59-140684	3/32	OP II	YES	080684	140684	25.5	17.9	54.1	9.8	6.4	124	220.4	124.2	32.2	67.4	230	1.1	.2	23500	13.4	293	<4	3185	136	<.1	16800	11050	1.15	4835	212
60-140684	1/8	OP II	YES	110684	140684	24.3	17.3	52.3	9.4	5.8	125	209.8	149.0	44.3	61.8	175	.7	<.2	23100	13.3	254	<4	3085	126	<.09	16250	10650	1.05	4440	201
61-140684	3/32	OP II	YES	120684	140684	24.2	18.6	50.4	9.9	5.9	114	211.6	174.8	23.7	48.7	455	2.2	.2	24300	11.8	455	<5	2905	124	<.09	16900	9855	1.2	4840	199
62-180784	3/32	OP II	YES	140684	180784	27.9	14.7	51.7	10.5	6.2	126	130.7	446.9	31.1	78.1	145	.4	.3	23350	10.7	240	<5	3095	134	<.09	17200	11550	1	5115	168
68-180784	3/32	OP II	YES	160784	180784	27.4	16.8	52.1	11.2	6.5	127	127.4	399.6	50.1	71.5	130	.5	.35	24150	9.70	323	<4	3220	122	<.07	17500	9945	1.1	7410	162
72-070884	1/8	OP II	YES	300784	070884	27.4	17.5	51.1	9.8	3	111	207.9	480.6	55.1	36.2	195	1.4	.2	19550	11.4	261	<5	2810	92	<.1	14450	9630	1.2	4940	187
73-070884	3/32	OP II	YES	300784	070884	27.1	17.4	51.3	9.9	2.4	111	181.6	652.7	193.0	92.5	195	1.8	<.2	19850	10.5	246	<5	2800	94	<.09	14450	9745	1.1	5005	180
74-070884	1/8	OP II	YES	010884	070884	28.2	17.7	51.7	9.6	3	114	266.4	738.0	164.2	81.5	185	2	.2	21800	10	232	<4	3075	98	<.09	15600	10645	1	5280	162
75-070884	3/32	OP II	YES	010884	070884	28.2	17.3	52.2	10.4	3	112	95.7	939.8	293.6	61.4	215	.7	.2	22650	8.1	201	<4	3110	95	<.09	15900	10950	1.00	5795	140
77-060984	1/8	OP II	YES	070884	060984	26.8	16.3	50.8	10.0	6.2	116	107.8	505.1	45.1	90.4	135	.9	.4	23150	8.3	218	<4	3125	131	<.09	16700	10500	.8	5215	153
81-060984	1/8	OP II	YES	080884	060984	27.7	17.2	52.7	11.5	9.2	117	96.3	445.9	51.7	81.0	595	.8	1.1	25050	9.2	554	<5	2945	126	<.09	16900	11100	1.5	7175	151
82-060984	3/32	OP II	NO	310084	060984	26.6	18.4	52.6	9.7	4.6	109	46.5	518.8	35.8	83.4	<20	1.1	.6	22400	8.7	188	<5	3010	116	<.09	16000	10300	.9	5360	150
84-060984	1/8	OP II	NO	310084	060984	26.5	16.5	51.7	9.9	5.3	112	37.0	336.7	35.4	83.1	100	.7	.6	22500	9.1	199	<4	3025	116	<.08	16200	11100	1	5275	155
85-060984	3/32	OP II	YES	220084	060984	26.8	16.0	52.3	10.2	5.1	116	90.3	380.3	30.6	88.8	130	.7	.8	22750	10.8	219	<5	3120	111	<.09	16200	11050	1.4	6525	151
87-060984	1/8	OP II	YES	040584	060984	28	16.9	52.6	10.4	7.6	107	96.7	418.1	41.2	62.0	155	.9	.8	22250	10.2	232	<4	3125	90	<.09	15600	12100	1.9	7285	152
89-101084	1/8	OP II	YES	110584	101084	27.1	16.0	54.7	10.3	6.7	116	245.1	551.2	59.7	53.7	170	2	.9	21700	17.9	176	<4	3115	74	<.09	16150	10450	2	7745	160
90-101084	3/32	OP II	YES		101084	26.6	16.5	55.3	10.2	12.2	132	222.1	559.4	66.3	45.0	165	1.6	.6	21900	10.5	238	<4	3185	131	<.08	16450	11350	2.5	6605	164
91-101084	1/8	OP II	NO	190584	101084	27.5	17.4	55.7	10.8	10.3	128	30.3	232.3	62.9	103.2	325	1.3	.4	22680	10.7	358	<4	3190	85	<.09	16850	10300	2.1	7410	161
93-101084	1/8	OP II	YES	051084	101084	26.7	17.7	53.8	10.2	12.4	127	260.0	495.4	83.2	56.3	250	2.4	.6	22000	11.8	272	<4	3110	57	<.08	16300	10600	2.4	7135	166
94-101084	3/32	OP II	YES	100584	101084	26.7	16.4	55.9	10.1	10.4	119	250.3	578.0	48.3	57.8	180	1.9	.9	22000	12.6	227	<4	3160	128	<.09	16500	11100	2.5	6440	165
95-101084	3/32	OP II	YES	101084	101084	26.9	17.2	52.9	10.7	12	121	343.0	496.3	58.4	65.1	180	1.3	.6	23550	10.9	224	<4	3240	50	<.08	17000	10700	2.1	6805	143

Table 13 con't: Results of chemical analyses of Oregon Moist Pellet fish food (OP II formula) from April 1984 to March 1985. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VITAMIN C YES/NO	PROD DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROT	% ASH	PEROX. VAL. (meq/kg OIL)	IODINE NO. (mg I/ g oil)	VIT C mg/100g	VIT E (ppa)	VIT A (ppa)	VIT B2 (ppa)	Al (ppa)	As (ppa)	Cd (ppa)	Ca (ppa)	Cu (ppa)	Fe (ppa)	Pb (ppa)	Mg (ppa)	Mn (ppa)	Hg (ppa)	P (ppa)	K (ppa)	Se (ppa)	Na (ppa)	Zn (ppa)
102-051184	3/32	OP II	YES	171084	051184	27.6	17.5	53.0	9.8	2.1	110	256.2	499.4	31.8	81.8	155	2.7	.5	19300	10.9	189	<4	3350	57	<.08	15250	11500	1.3	8410	156
103-051184	1/8	OP II	YES	171084	051184	26.9	17.2	52.0	9.8	3.2	113	296.3	525.7	31.6	63.8	165	2.4	.5	19700	11.5	203	<4	3405	57	<.08	15250	11400	1.2	7270	158
105-051184	1/8	OP II	YES	311084	051184	28.1	16.8	52.2	10.2	3.1	115	278.6	491.2	35.6	60.6	165	2.1	.7	21150	10.9	238	<4	3505	48	<.09	15450	11800	1.5	7015	138
110-261184	1/8	OP II	YES	191184	261184	25.9	17.5	52.9	10.0	3.5	116	280.6	460.9	30.9	74.1	245	4.5	.3	22650	9.9	261	<4	3730	62	<.08	17500	13450	<.08	9800	139
112-171284	1/8	OP II	YES	281184	171284	29.7	17.5	48.8	10.5	5.7	102	221.3	577.8	21.5	75.4	320	1.5	.5	23050	19.5	301	<5	3410	60	<.09	16750	13250	1	9580	175
118-171284	1/8	OP II	NO	061284	171284	28.1	17.7	53.0	10.2	5	107	57.0	429.1	22.3	73.4	210	1	.4	23650	19	305	<4	3580	62	<.09	16350	13850	1.4	8920	219
119-171284	1/8	OP II	YES	051284	171284	28.5	18.2	53.3	10.2	4.8	120	237.8	384.6	26.2	85.3	290	1.4	.5	21750	18.6	345	<4	3480	64	<.08	16200	14000	1.3	8445	240
122-171284	3/32	OP II	NO	121284	171284	28.2	18.4	53.8	10.3	4.4	113	57.0	487.6	27.0	75.3	385	1.9	.25	26400	24.1	338	<4	3250	75	<.09	16750	12300	1	6080	281
123-171284	3/32	OP II	NO	121284	171284	27.2	17.7	53.2	10.2	4.3	108	33.1	476.9	20.6	58.1	335	1.8	.45	21450	19.3	311	<4	3305	61	<.08	15200	13500	1.1	8350	232
124-171284	1/8	OP II	NO	121284	171284	29.3	17.3	51.6	10.2	5.7	108	70.0	608.8	21.5	85.2	130	1.3	.55	20500	49.5	233	<5	3360	53	<.09	14800	13850	1.5	9250	220
125-171284	1/8	OP II	YES	121284	171284	29.3	18.4	53.5	10.0	5.6	105	228.7	308.3	28.6	62.7	190	.9	.35	25400	22.9	249	<4	3360	67	<.08	16750	13300	1.1	5745	177
127-171284	3/32	OP II	YES	131284	171284	29.4	20.4	51.3	10.3	6	102	246.3	448.3	31.4	72.6	325	2	.4	25950	22	334	<4	3445	66	<.09	16650	13700	1.2	5910	193
147-040285	5/32	OP II	YES	250185	040285	30.9	19.0	51.4	10.3	<1	107	255.3	624.2	80.0	89.3	420	2.2	.5	20450	11.2	317	<4	3095	53	<.09	14550	10900	.8	5030	168
150-040285	3/32	OP II	YES	290185	040285	30.6	19.2	51.6	10.5	<1	117	244.7	248.1	70.9	62.5	515	2.5	.5	20750	11.8	477	<5	2985	57	<.09	14100	10180	1.6	4535	185
151-040285	3/32	OP II	NO	290185	040285	30.2	19.2	51.6	10.2	<1	121	102.0	317.9	63.9	61.2	355	2.5	.5	19300	10.9	367	<4	2875	53	<.09	13400	9760	.8	4225	181
158-260285	1/8	OP II	NO	130285	260285	27.8	16.3	53.2	10.4	9.5	109	53.2	312.9	88.7	52.2	320	2.3	.5	22450	9.90	235	<4	3030	55	<.09	14500	10750	1.7	5085	172
159-260285	3/32	OP II	NO	140285	260285	28.4	14.9	53.4	10.1	12.5	128	58.2	433.4	46.4	77.1	230	2	.4	21450	10.7	217	<4	3220	56	<.08	14300	11450	1.8	5225	192
165-050385	5/32	OP II	YES	260285	050385	28.8	15.4	53.4	10.1	8	122	127.9	397.9	136.8	76.3	205	1.8	.55	21900	10.9	239	<5	3165	56	<.09	14750	11200	1.6	5170	182
166-050385	5/32	OP II	NO	260285	050385	28.7	15.4	52.9	10.2	6.6	131	16.7	532.7	137.6	66.2	215	1.3	.4	20950	10.3	231	<4	3000	52	<.08	14800	13150	1.5	5085	172
170-050385	3/32	OP II	YES	270285	050385	25.4	16.5	52.3	10.3	6.9	122	126.7	484.6	185.4	71.6	255	1.8	.45	21500	11.2	281	<4	2935	56	<.09	14400	10250	1.7	4825	189
171-050385	3/32	OP II	NO	270285	050385	27.4	16.8	53.0	10.1	8.3	124	20.2	501.8	146.8	66.4	135	1	.6	18850	12.1	307	<4	3005	54	<.09	13550	10570	1.6	4940	198
172-050385	1/8	OP II	NO	280285	050385	27.8	17.3	51.7	10.1	9.6	118	13.2	465.4	149.0	72.3	260	1	.45	19450	10.2	301	<4	3080	53	<.08	14000	12950	1.4	6350	170
173-050385	1/8	OP II	YES	010385	050385	27.3	17.7	51.7	10.3	10.5	130	142.2	351.2	100.8	60.2	235	1.4	.5	17650	12.5	391	<4	2605	54	<.09	12750	8880	1.7	4610	197
182-190385	3/32	OP II	YES	120385	190385	27.7	16.2	51.6	11.8	15.7	103	207.2	461.4	15.5	71.1	220	.8	.5	18500	10.5	312	<4	3165	52	<.08	13350	12450	1.3	6465	183
185-190385	1/8	OP II	YES	140385	190385	28	15.4	53.3	10.6	13.6	102	189.7	464.9	22.9	54.1	350	1.4	.5	20100	9.8	358	<4	3045	55	<.07	13700	11600	1.4	6490	189
189-260385	1/8	OP II	YES	160385	260385	28.1	19.1	54.2	10.3	9.7	129	186.2	500.4	19.2	59.2	370	1.7	.55	19950	9.4	440	<4	3030	58	<.08	14400	11400	1.2	5725	171
190-260385	1/8	OP II	NO	170385	260385	27.4	19.4	51.2	9.6	9.8	125	38.0	425.1	16.3	58.9	145	1.6	.5	18300	9.40	325	<4	3020	48	<.09	13800	11400	1.5	6440	169
*191-260385	3/32	OP II	NO	170385	260385	27.6	20.6	55.5	12.6	6.8	127	21.7	502.1	18.8		1440	1.9	.85	22350	8.5	685	<5	2410	58	<.09	14350	9525	.8	7350	179
194-260385	3/32	OP II	YES	190385	260385	28	19.3	51.8	9.6	11.3	126	188.5				145	1.7	.65	18200	11.5	345	4	3070	52	<.09	13800	11050	1.3	5470	193
					AVERAGE	27.2	17.4	52.3	10.3	7.2	118.0	157.2	432.2	62.2	69.6	259	1.5	.5	22074	12.2	292	4	3076	90		15883	11078	1.5	6214.7	176
					MAXIMUM	30.9	20.6	55.9	14.0	15.7	143	343.0	939.8	293.6	103.2	1440	4.5	1.05	27950	49.5	752	4	3730	172		19500	14000	4.4	9880	281
					MINIMUM	23.8	14.7	48.2	9.2	2.1	102	13.2	124.2	15.5	36.2	100	.4	.2	17650	8.1	176	4	2410	48		12750	8785	.8	3975	134
					NUMBER	67	67	67	67	64	67	67	66	66	65	66	67	63	67	67	67	1	67	67		67	67	66	67	67

* Quality control records indicate the pellet sizes shown, however, aluminum and iron results are not consistent with comparable samples.

Table 14: Results of chemical analyses of Oregon Moist Pellet fish food (OP IV formula) from April 1985 to March 1986. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	EXTRA VIT C	PROD DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROTEIN	% ASH	PEROX. VALUE (meq/ kg OIL)	IODINE NO. (eg I/ g OIL)	% FREE FATTY ACIDS	VIT. C mg/100g	VIT.E (ppm)	VIT.B2 (ppm)	VIT.A (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	K (ppm)	P (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)	TPC #/g	E.coli MPN/g	SALM.
TF1	1/32	YES	230485	060585	30.8	22.2	55.7	14.1	10.4	132.4	8.7	153.3	311.3	57.4	31.5	2117	<7.5	<.75	24505	6.52	856	3.26	2465	54.4	.06	7612	16965	5.44	8570	157	5400000	<.3	-VE
TF4	3/64	YES	150585	220585	29.6	21.0	54.4	14.6	5.8	130.6	9.0	87.5	336.3	59.8	19.9	2684	<7.5	<.75	26838	7.81	956	3.02	2556	56.1	.07	6873	17040	2.50	7540	156	1800000000	<.3	-VE
TF6	1/32	YES	150585	220585	29.3	20.0	54.4	14.4	6.3	137.2	10.5	77.7	304.1	60.6	18.9	2270	<7.5	<.75	26649	8.11	843	3.07	2496	66.0	.04	6874	16920	1.76	7600	185	880000000	<.3	-VE
TF7	1/16	YES	030685	240685	28.0	19.7	54.3	14.7	13.4	101.4	12.9	194.6	451.1	44.6	38.1	3280	<7.5	<.75	27383	5.56	1195	3.47	2405	64.5	.10	7728	19043	1.47	8757	172	170000	15	-VE
TF9	1/16	YES	270685	220785	27.9	20.6	56.9	14.6	8.4	121.8	9.8	115.8	331.4	51.0	22.9	2975	<30	<2.5	27800	9.73	1091	<8	1946	61.2	.13	5977	17931	.65	9035	177	75000	<.3	-VE
TF14	3/64	YES	071185	251185	27.8	21.4	56.7	13.5	4.6	112.8	8.7	53.0	195.7	76.4		2168	<30	<2.5	24464	6.81	823	<8	2377	71.4	.10	7478	18070	1.65	7853	203	6300000	<.3	-VE
TF15	3/64	NO	051185	251185	25.7	18.4	59.4	14.3	4.8	123.3	8.7	13.2	148.0	62.6	41.3	2848	<30	<2.5	24975	10.12	1131	<8	2133	65.7	.14	8060	18900	1.92	8073	188	9100000	<.3	-VE
TF17	1/16	YES	201185	251185	26.8	20.7	54.1	13.6	4.2	116.1	7.8	77.5	232.2	55.5	32.9	2850	<30	<2.5	22057	6.99	1008	<8	2384	78.1	.10	7508	17125	1.60	8658	190	80000000	<.3	-VE
TF18	1/32	YES	041285	161285	27.8	17.1	57.0	14.3	7.9	119.8	12.2	65.6	120.4	58.4	180.7	2669	<30	.85	24464	6.12	890	<8	2113	62.5	.08	10286	18209	1.58	10119	136	50800000	<.3	-VE
TF20	1/32	YES	261285	100186	26.8	14.8	54.7	14.1	7.4	133.4	8.7	11.0	245.5	50.3	70.8	2973	<30	.38	25893	6.29	1084	<2.5	2110	61.5	.10	6603	18221	2.18	7919	170	250000	<.3	-VE
TF22	3/64	NO	060186	100186	25.9	16.9	53.7	13.9	7.7	126.9	6.7	7.2	76.7	52.5	26.2	2457	<30	.39	25515	7.49	991	<2.5	2079	72.9	.08	7182	18090	2.75	7088	177	2500000	<.3	-VE
TF23	3/64	YES	080186	100186	24.4	15.8	53.1	13.3	8.4	135.0	4.7	14.0	353.1	46.9	18.7	2548	<30	.32	26400	5.54	915	<2.5	1901	54.0	.07	7049	18348	3.09	5729	133	3700000	<.3	-VE
TF24	3/64	YES	210186	040286	28.7	18.5	54.0	14.0	13.1	114.7	10.8	15.8	351.8	41.2	62.0	3682	<30	.39	27300	4.48	1077	<8	2100	58.8	.07	8372	18900	1.68	5656	179	2800000	<.3	-VE
TF26	1/32	YES	030286	040286	28.4	20.0	53.8	14.3	7.6	105.2	7.3	10.5	289.1	48.6	50.5	3542	<30	.46	28560	5.04	1036	<8	2044	52.6	.07	8400	19180	1.96	5334	171	120000	<.3	-VE
TF28	3/64	YES	140286	250286	27.4	18.5	56.3	14.5	9.6	133.1	2.5	14.8	302.2	54.1	20.4	3119	<30	.55	26910	<1.5	1267	<8	2525	64.2	.12	8915	22356	1.77	9467	170	9000000	15	-VE
TF29	1/32	YES	140286	250286	26.6	18.8	56.3	13.6	8.9	134.6	3.3	9.7	104.3	67.3	8.3	2434	<30	.48	25296	5.98	1012	<8	2312	72.4	.10	8541	21488	1.24	9452	175	7000000	-VE	-VE
TF30	1/32	YES	260286	180386	26.7	19.3	57.3	13.7	3.6	140.0	2.7	49.8	202.5	53.6	25.8	2162	<30	.56	30192	6.60	888	<8	1986	60.8	.12	6419	22576	1.85	5127	166	17000000	-VE	-VE
TF31	3/64	YES	280286	180386	26.4	19.9	56.3	14.1	6.8	129.0	2.9	66.4	488.8	54.4	53.3	3386	<30	.54	28424	5.78	1355	<8	2250	68.8	.11	6596	21760	2.08	5358	182	22000000	-VE	-VE
TF32	3/64	YES	040386	180386	27.4	19.2	56.3	14.5	5.5	136.0	2.9	104.3	437.5	72.4	51.9	3064	<30	.47	26634	5.31	1227	<8	2111	67.5	.14	6721	21252	2.26	7728	166	630000	-VE	-VE
					----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
				AVERAGE	27.5	19.3	55.5	14.1	7.6	125.4	7.4	60.1	278.0	56.2	43.0	2801		.49	26329	6.68	1034	3.21	2226	63.9	.09	7536	19072	2.08	7635	171	152465526		
				MAXIMUM	30.8	22.2	59.4	14.7	13.4	140.0	12.9	194.6	488.8	76.4	180.7	3682		.85	30192	10.12	1355	3.47	2556	78.1	.14	10286	22576	5.44	10119	203	1800000000		
				MINIMUM	24.4	14.8	53.1	13.3	3.6	101.4	2.5	7.2	76.7	41.2	8.3	2117		.32	22057	4.48	823	3.02	1901	52.6	.04	5977	16920	.65	5127	133	75000		
				NUMBER	19	19	19	19	19	19	19	19	19	19	18	19		11	19	18	19	4	19	19	19	19	19	19	19	19	19		

Table 15: Results of chemical analyses of Oregon Moist Pellet fish food (OP II formula) from April 1985 to March 1986. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	EXTRA VIT C	PROD DATE (DDMMYY)	ANAL DATE (DDMMYY)	% MOIST	% LIPID	% PROTEIN	% ASH	PEROX. VALUE (meq/kg OIL)	IODINE NO. (mg I/g OIL)	% FREE FATTY ACIDS	VIT. C mg/100g	VIT.E (ppm)	VIT.B2 (ppm)	VIT.A (ppm)	Al (ppm)	As (ppm)	Cd (ppm)	Ca (ppm)	Cu (ppm)	Fe (ppm)	Pb (ppm)	Mg (ppm)	Mn (ppm)	Hg (ppm)	K (ppm)	P (ppm)	Se (ppm)	Na (ppm)	Zn (ppm)	TPC #/g	E.coli MPN/g	SALM.
TF2	3/32	YES	200585	220585	28.1	18.2	49.1	9.6	7.5	125.8	10.1	205.9	319.3	67.3	15.2	93	<7.5	<.75	19460	10.29	207	<2	3336	47.5	.04	2613	15568	1.58	5463	170	1300000	.91	-VE
TF3	3/32	YES	060585	220585	30.1	16.7	51.8	9.9	5.0	134.2	9.7	143.7	368.9	63.8	9.9	265	<7.5	<.75	20020	11.08	292	<2	3260	51.2	.07	11654	15730	2.29	6278	164	7100000	>110	-VE
TF5	3/32	NO	150585	220585	27.9	14.9	51.0	9.5	6.0	126.2	10.4	35.4	434.7	66.6	11.7	104	<7.5	<.75	20155	14.32	202	<2	3253	49.5	.08	11120	15707	1.88	6060	157	980000000	<.3	-VE
TF8	3/32	YES	170685	240685	26.0	17.0	51.3	9.6	11.1	99.6	15.7	225.3	469.0	41.2	7.4	204	<7.5	<.75	19440	9.42	379	4.23	2740	49.3	.09	10341	16875	.96	5589	163	250000	4.3	-VE
TF10	3/32	YES	160785	220785	27.4	17.0	53.4	10.5	11.3	108.6	11.3	237.4	483.8	54.4	27.2	291	<30	<2.5	19596	13.80	345	<8	3271	58.0	.10	10074	16008	.44	8142	189	70000	<.3	-VE
TF11	1/8	YES	110985	300985	27.7	17.2	53.5	10.1	8.7	123.6	10.5	242.6	766.2	123.6	42.9	160	<30	<2.5	19320	13.80	288	<8	3478	55.9	.08	11178	17250	1.97	5617	207	2000000	<.3	-VE
TF12	1/8	YES	180985	300985	29.0	17.6	53.4	10.0	10.6	117.0	8.8	241.4	747.4	68.0	25.5	149	<30	<2.5	19176	9.73	327	<8	3398	55.6	.07	12211	17061	2.31	6782	200	3400000	<.3	-VE
TF13	1/8	YES	021085	281085	25.8	15.9	53.7	9.2	6.2	134.4	13.8	148.5	310.0	72.6	15.4	184	<30	<2.5	17010	9.65	244	<8	2930	46.6	.11	10935	16065	1.74	5400	146	1400000	<.3	-VE
TF16	1/8	NO	141185	251185	26.9	18.4	52.7	9.3	4.4	119.1	11.1	8.5	210.7	61.8	52.3	185	<30	<2.5	16851	9.18	285	<8	2959	56.2	.08	9837	16440	1.44	5535	184	>240M	<.3	-VE
TF19	1/8	YES	101285	161285	26.9	18.1	51.5	9.6	8.4	121.2	9.5	188.1	129.5	59.6	207.6	226	<30	.09	18769	9.04	219	<8	3110	55.5	.08	12878	15344	1.15	7973	158	5800000	<.3	-VE
TF21	1/8	YES	26-271285	100186	25.7	17.0	50.4	9.6	5.8	132.8	7.6	94.9	210.1	83.3	45.8	209	<30	.34	17550	9.59	263	<2.5	2970	51.7	.05	10530	15795	2.15	6183	159	510000	<.3	-VE
TF25	3/32	YES	310186	040286	24.0	17.0	51.2	9.5	5.4	124.5	7.3	67.7	346.2	59.4	43.4	269	<30	.46	16764	8.58	327	<8	2957	57.8	.09	13332	16236	1.45	5966	176	170000	<.3	-VE
TF27	1/8	NO	6,110286	250286	27.9	16.7	56.2	10.3	11.1	116.7	2.9	8.2	194.5	59.5	12.8	317	<30	.61	21545	6.67	322	<8	3002	50.9	.08	11718	20850	1.31	7520	157	4300000	29	-VE
TF33	1/8	NO	120386	180386	27.4	16.6	54.0	9.5	7.9	134.0	4.4	18.5	267.4	57.3	23.9	228	<30	.48	17388	7.93	317	<8	3091	58.1	.10	10378	18906	1.24	6224	168	310000	-VE	-VE
				AVERAGE	27.2	17.0	52.4	9.7	7.8	122.7	9.5	133.3	375.5	67.0	38.6	206		.56	18780	10.22	287	4.23	3125	53.1	.08	10628	16702	1.57	6338	171	77431538		
				MAXIMUM	30.1	18.4	56.2	10.5	11.3	134.4	15.7	242.6	766.2	123.6	207.6	317		.89	21545	14.32	379	4.23	3478	58.1	.11	13332	20850	2.31	8142	207	980000000		
				MINIMUM	24.0	14.9	49.1	9.2	4.4	99.6	2.9	8.2	129.5	41.2	7.4	93		.34	16764	6.67	202	4.23	2740	46.6	.04	2613	15344	.44	5400	146	70000		
				NUMBER	14	14	14	14	14	14	14	14	14	14	14	14		5	14	14	14	1	14	14	14	14	14	14	14	14	13		

Table 16: Results of chemical analyses of Oregon Moist Pellet fish food (OP IV formula) from April 1985 to March 1986. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VITAMIN C	PRODUCTION DATE (DDMMYY)	DELIVERY DATE FOR ANALYSIS (DDMMYY)	SAMPLE TIME	% MOISTURE	% LIPID	% ASH	PEROXIDE VALUE (meq/ kg oil)	IODINE NUMBER (eg I/ g OIL)	% FREE FATTY ACIDS	VITAMIN C ug/100g
PF1	1/16	OP IV	YES	280385	150485	1100	30.5	21.5	15.1	8.6	98.7	10.3	200.6
PF4	1/16	OP IV	YES	010485	150485	330	31.1	20.7	15.8	5.0	100.0	7.4	240.5
PF5	3/64	OP IV	YES	020485	150485	705	30.2	20.4	14.4	6.3	96.8	7.5	124.3
PF10	1/16	OP IV	NO	190385	150485	LOADING	31.2	21.7	14.7	4.6	100.9	9.4	47.4
PF11	3/64	OP IV	NO	020485	150485	LOADING	29.7	21.2	15.0	5.7	102.5	8.9	18.8
PF12	1/32	OP IV	NO	010485	150485	LOADING	28.8	20.9	14.9	6.0	99.2	11.2	18.5
PF18	3/64	OP IV	NO	180485	060585	945AM	28.3	20.8	14.1	10.5	132.1	4.9	14.0
PF19	1/16	OP IV	NO	180485	060585	100PM	29.3	20.0	14.7	7.6	137.7	8.5	31.3
PF21	1/32	OP IV	NO	010485	060585	LOADING	29.0	21.3	14.4	11.7	137.4	8.6	17.7
PF22	3/64	OP IV	YES	240485	060585	800AM	28.6	21.5	14.8	9.4	141.8	8.9	159.7
PF23	1/32	OP IV	YES	240485	060585	100PM	28.3	20.3	15.2	9.4	142.9	9.8	155.1
PF29	1/16	OP IV	YES	080585	220585	930	27.2	20.4	13.6	6.1	131.5	7.5	208.1
PF31	1/16	OP IV	YES	210585	220585	700PM	27.0	19.7	14.0	6.0	130.9	9.0	222.2
PF32	3/64	OP IV	NO	220585	220585	935AM	27.6	20.4	13.8	5.0	133.6	7.5	30.0
PF33	1/32	OP IV	NO	150585	220585	930	28.7	20.8	14.0	6.1	130.5	9.1	24.8
PF34	1/32	OP IV	NO	220585	300585	330	27.1	19.9	14.5	6.2	125.8	9.3	33.8
PF37	3/64	OP IV	NO	280585	300585	940	29.1	21.0	14.0	6.5	117.3	8.7	29.5
PF38	1/16	OP IV	NO	230585	300585	LOADING	28.0	19.7	14.8	6.4	123.3	9.3	34.7
PF41	3/64	OP IV	YES	030685	240685	800AM	27.5	19.6	13.8	13.0	107.6	9.0	177.4
PF42	3/64	OP IV	YES	100685	240685	800AM	27.6	18.1	13.7	13.1	101.9	9.7	161.8
PF44	1/32	OP IV	YES	170685	240685	800AM	27.3	18.6	14.4	11.7	95.3	7.5	323.5
PF45	3/64	OP IV	YES	240685	240685	1045	27.4	18.6	14.2	12.3	93.0	9.9	171.3
PF46	3/64	OP IV	YES	270685	220785	1200	28.3	20.8	15.1	11.6	115.5	8.1	140.2
PF49	1/16	OP IV	NO	020785	220785	LOADING	30.4	19.9	14.9	10.6	110.1	11.6	15.9
PF60	1/32	OP IV	YES	7-91085	281085	1100	25.1	18.9	14.1	5.4	123.7	10.1	130.3
PF64	1/16	OP IV	NO	121185	251185	900	29.1	21.6	13.9	6.4	107.8	7.7	12.1
PF65	1/32	OP IV	YES	131185	251185	925	27.5	19.0	15.4	6.8	122.8	9.1	17.0
PF67	1/16	OP IV	YES	181185	251185	1200	26.5	18.7	14.0	6.5	124.6	10.3	122.6
PF68	1/32	OP IV	YES	191185	251185	630	26.9	20.4	16.6	6.8	123.4	9.8	224.5
PF69	3/64	OP IV	YES	201185	251185	730	26.8	20.2	15.1	7.7	118.3	9.2	197.3
PF72	1/16	OP IV	NO	181185	161285	LOADING	26.8	18.9	13.8	8.2	119.4	8.7	11.7
PF73	3/64	OP IV	NO	131185	161285	LOADING	26.5	18.6	14.6	6.7	119.1	10.2	9.0
PF75	1/32	OP IV	NO	191185	161285	LOADING	26.0	19.9	15.3	7.0	113.9	9.9	10.9
PF80	3/64	OP IV	YES	060186	100186	200	24.9	18.9	14.2	6.1	132.0	5.3	88.4
PF81	1/32	OP IV	NO	191185	100186	LOADING	26.7	20.3	14.3	5.9	138.4	7.2	3.7
PF82	1/32	OP IV	YES	080186	100186	800	24.7	17.6	13.9	5.7	130.3	5.8	88.2
PF83	1/16	OP IV	YES	130186	040286	800	28.5	19.3	14.0	7.6	105.2	7.2	76.9
PF85	1/32	OP IV	YES	210186	040286	140	29.6	19.6	15.5	9.0	104.0	6.7	46.2
PF86	3/64	OP IV	YES	290186	040286	830	27.8	18.6	14.7	4.9	103.0	7.6	100.4
PF88	1/16	OP IV	YES	040286	040286	800	27.6	20.3	14.2	14.1	114.2	7.4	167.5
PF89	1/16	OP IV	NO	040286	040286	1030	26.8	19.7	13.9	7.6	119.5	7.5	17.1
PF93	1/16	OP IV	YES	130286	250286	900	25.6	19.8	13.7	12.4	126.8	2.5	139.8
PF96	3/64	OP IV	YES	260286	180386	715	28.9	20.7	14.9	5.3	126.0	2.9	53.2
PF99	1/32	OP IV	YES	280286	180386	600	30.5	20.3	14.8	5.4	129.0	2.6	110.5
PF101	1/16	OP IV	YES	040386	180386	715	28.8	20.5	14.0	5.5	137.0	2.4	89.0
PF102	1/32	OP IV	YES	040386	180386	700	27.4	18.9	14.2	7.8	134.0	2.8	87.3
PF105	3/64	OP IV	YES	170386	180386	815	30.7	21.4	14.6	7.1	132.0	2.3	130.2
PF106	1/16	OP IV	NO	6,140386	180386	LOADING	28.0	20.6	14.6	6.7	129.0	2.7	15.1
						AVERAGE	28.0	20.0	14.5	7.8	119.6	7.7	94.8
						MAXIMUM	31.2	21.7	16.6	14.1	142.9	11.6	323.5
						MINIMUM	24.7	17.6	13.6	4.6	93.0	2.3	3.7
						NUMBER	48	48	48	47	48	48	48

Table 17: Results of chemical analyses of Oregon Moist Pellet fish food (OP II foraula) from April 1985 to March 1986. (on a dry weight basis)

SAMPLE NUMBER	PELLET SIZE	FEED TYPE	EXTRA VITAMIN C	PRODUCTION DATE (DDMMYY)	DELIVERY DATE FOR ANALYSIS (DDMMYY)	SAMPLE TIME	% MOISTURE	% LIPID	% ASH	PEROXIDE VALUE (meq/ kg oil)	IODINE NUMBER (mg I/ g OIL)	% FREE FATTY ACIDS	VITAMIN C ug/100g
PF2	3/32	OP II	YES	280385	060585	730	28.5	16.1	9.6	11.6	144.2	10.7	128.5
PF3	1/8	OP II	YES	250385	150485	LOADING	28.9	15.8	10.1	6.0	96.6	12.2	190.3
PF8	1/8	OP II	YES	020485	150485	900	27.1	16.8	10.5	6.2	98.4	12.8	239.0
PF9	3/32	OP II	YES	030485	150485	800	28.9	17.5	14.1	5.6	103.5	10.1	198.1
PF14	5/32	OP II	YES	090485	150485	800	30.1	16.7	10.1	8.1	101.5	11.6	209.2
PF15	1/8	OP II	YES	110485	150485	830	27.0	16.2	10.3	5.8	100.9	7.7	234.7
PF16	5/32	OP II	YES	120485	150485	210	28.1	19.8	10.5	9.7	99.7	9.8	195.9
PF17	1/8	OP II	YES	120485	150485	4PM	27.8	17.2	10.2	9.1	103.4	11.0	248.9
PF20	1/8	OP II	NO	190485	060585	815	29.5	17.5	10.6	9.6	139.7	8.4	21.3
PF24	3/32	OP II	YES	250485	060585	910PM	30.4	18.2	11.2	9.1	124.0	7.8	178.8
PF25	1/8	OP II	YES	260485	060585	130PM	28.7	16.6	10.6	8.7	144.9	10.2	171.8
PF26	3/32	OP II	NO	290485	060585	1120AM	28.7	16.5	10.4	10.1	144.7	10.5	33.2
PF28	5/32	OP II	YES	070585	220585	1100PM	27.3	14.5	9.0	5.9	137.3	9.3	207.4
PF30	1/8	OP II	NO	140585	220585	LOADING	26.0	18.3	8.5	6.6	125.3	7.9	48.0
PF35	3/32	OP II	YES	220585	300585	600PM	27.4	18.4	9.9	5.2	128.1	8.3	221.7
PF36	1/8	OP II	NO	230585	300585	1045	27.6	17.9	10.5	7.6	116.3	9.3	56.8
PF39	3/32	OP II	NO	240585	300585		28.6	18.7	10.3	7.1	116.3	9.6	46.1
PF40	3/32	OP II	YES	290585	300585	900	27.7	18.5	9.7	5.8	130.8	9.8	236.5
PF43	3/32	OP II	YES	030685	240685		26.2	17.3	9.5	9.7	93.8	11.9	155.7
PF47	3/32	OP II	NO	270685	220785	400	28.1	15.0	9.8	11.4	119.8	11.9	194.6
PF48	3/32	OP II	NO	02-030785	220785	LOADING	28.5	13.7	10.4	13.2	111.3	12.3	49.2
PF50	3/32	OP II	YES	290785	030985	1100	29.0	17.1	10.2	7.3	137.5	12.6	133.6
PF51	1/8	OP II	YES	290785	030985	500	28.7	17.7	9.7	6.1	124.5	12.1	164.6
PF52	3/32	OP II	YES	130885	030985	800	29.7	17.3	9.3	5.6	127.6	10.2	134.6
PF53	3/32	OP II	YES	210885	030985	600	28.4	17.9	9.5	6.6	117.3	14.0	190.0
PF54	1/8	OP II	YES	210885	030985	700	27.9	17.7	8.3	7.2	120.4	11.3	137.6
PF55	3/32	OP II	YES	090985	300985	600	29.4	17.4	9.7	12.3	121.9	9.9	246.4
PF56	1/8	OP II	NO	100985	300985	230	27.4	17.4	9.6	9.1	119.2	10.6	64.6
PF57	3/32	OP II	NO	050985	300985	LOADING	29.0	17.4	10.1	10.0	122.6	10.0	56.6
PF58	3/32	OP II	YES	180985	300985	900	30.0	18.4	9.7	7.8	121.1	12.1	229.0
PF59	3/32	OP II	YES	101085	281085	930	24.1	16.8	9.6	4.1	123.2	15.5	121.2
PF61	1/8	OP II	YES	211085	281085	700	26.9	15.8	9.4	6.8	130.1	12.8	172.9
PF62	1/8	OP II	YES	151085	281085	900	26.8	18.1	14.3	5.6	132.8	11.1	127.5
PF63	1/8	OP II	YES	301085	251185	900	27.0	17.9	9.4	6.1	118.7	12.9	28.6
PF70	1/8	OP II	NO	201185	251185	230	25.6	18.6	9.7	6.7	124.5	10.8	13.2
PF71	1/8	OP II	NO	171185	161285	LOADING	27.1	16.7	9.7	6.2	116.7	10.2	21.9
PF74	3/32	OP II	NO	201185	161285	LOADING	27.0	17.5	9.9	6.4	120.0	10.4	25.9
PF76	5/32	OP II	YES	101285	161285	11PM	26.7	18.0	9.1	6.3	116.4	8.3	216.9
PF77	1/8	OP II	YES	020186	100186	200	27.1	17.0	9.2	5.4	132.5	6.3	131.1
PF84	1/8	OP II	YES	200186	040286	600	27.4	15.0	9.4	2.1	98.9	9.2	218.7
PF90	5/32	OP II	YES	110286	250286	930	25.2	17.9	9.8	13.9	146.6	3.2	155.1
PF91	3/32	OP II	YES	110286	250286	700	25.1	17.2	9.2	14.3	138.5	3.4	128.0
PF94	5/32	OP II	YES	220286	250286	715	26.6	18.8	9.3	13.0	132.3	2.8	137.1
PF95	3/32	OP II	YES	220286	250286	1100	25.0	17.9	9.7	13.5	143.9	3.0	109.9
PF97	1/8	OP II	YES	260286	180386	630	28.4	19.1	9.9	5.7	132.0	2.8	156.7
PF100	1/8	OP II	YES	030386	180386	800	28.1	18.8	9.0	5.4	133.0	2.2	205.3
PF103	5/32	OP II	YES	040386	180386	1100	27.7	18.4	10.5	7.7	129.0	2.7	188.9
PF104	3/32	OP II	YES	060386	180386	725	27.4	20.0	11.7	7.2	125.0	2.9	95.7
						AVERAGE	27.7	17.4	10.0	7.9	122.6	9.3	143.3
						MAXIMUM	30.4	20.0	14.3	14.3	146.6	15.5	248.9
						MINIMUM	24.1	13.7	8.3	2.1	93.8	2.2	13.2
						NUMBER	48	48	48	48	48	48	48

Table 18: Results of bacteriological tests on Oregon Moist Pellet fish food from April 1985 to March 1986.

SAMPLE NUMBER	PELLET SIZE	PROD DATE (DDMMYY)	DELIVERY DATE FOR ANALYSIS (DDMMYY)	TOTAL PLATE COUNT #/g	E. coli MPN/g	Salmonella
TF1	1/32	230485	060585	5400000	<.3	-VE
TF2	3/32	200585	220585	1300000	.91	-VE
TF3	3/32	060585	220585	7100000	>110	-VE
TF4	3/64	150585	220585	1000000000	<.3	-VE
TF5	3/32	150585	220585	980000000	<.3	-VE
TF6	1/32	150585	220585	880000000	<.3	-VE
TF7	1/16	030685	240685	170000	15	-VE
TF8	3/32	170685	240685	250000	4.3	-VE
TF9	1/16	270685	220785	75000	<.3	-VE
TF10	3/32	160785	220785	70000	<.3	-VE
TF11	1/8	110985	300985	2000000	<.3	-VE
TF12	1/8	180985	300985	3400000	<.3	-VE
TF13	1/8	021085	281085	1400000	<.3	-VE
TF14	3/64	071185	251185	6300000	<.3	-VE
TF15	3/64	051185	251185	9100000	<.3	-VE
TF16	1/8	141185	251185	>240000000	<.3	-VE
TF17	1/16	201185	251185	80000000	<.3	-VE
TF18	1/32	041285	161285	50800000	<.3	-VE
TF19	1/8	101285	161285	5800000	<.3	-VE
TF20	1/32	261285	100186	250000	<.3	-VE
TF21	1/8	26-271285	100186	510000	<.3	-VE
TF22	3/64	060186	100186	2500000	<.3	-VE
TF23	3/64	080186	100186	3700000	<.3	-VE
TF24	3/64	210186	040286	2800000	<.3	-VE
TF25	3/32	310186	040286	170000	<.3	-VE
TF26	1/32	030286	040286	120000	<.3	-VE
TF27	1/8	6,110286	250286	4300000	29	-VE
TF28	3/64	140286	250286	9000000	15	-VE
TF29	1/32	140286	250286	7000000	-VE	-VE
TF30	1/32	260286	180386	17000000	-VE	-VE
TF31	3/64	280286	180386	22000000	-VE	-VE
TF32	3/64	040386	180386	630000	-VE	-VE
TF33	1/8	120386	180386	310000	-VE	-VE
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			AVERAGE	96982969		
			MAXIMUM	1000000000		
			MINIMUM	70000		
			NUMBER	32		